

**MIGRATORY BIRD ANALYSIS
PROPOSED ROSEMONT COPPER MINE
NOGALES RANGER DISTRICT
CORONADO NATIONAL FOREST**

Prepared for

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Introduction

This is one of several documents disclosing the potential effects of the proposed Rosemont Copper Project (project) on plants and animals of conservation concern. Although the proposed project and its connected actions are located across several jurisdictions, this report is being written to comply with Federal requirements for disclosure of effects on migratory birds, as well as to provide a foundation for mitigation and minimization recommendations.

Regulatory Framework

The primary laws and regulations specifically addressing migratory birds for this report appear in the Migratory Bird Treaty Act of 1918, as amended (MBTA), and Executive Order (EO) 13186. The Migratory Bird Treaty Act (16 United States Code (U.S.C.) 703–711) addresses direct taking, killing, and possessing of migratory birds in various treaties and conventions with other nations. This law is not generally pertinent to this proposed project, although a disclosure of unintentional take is required. Other related statutes include the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321–4347), Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d), Endangered Species Act of 1973 (16 U.S.C. 1531–1544), and Fish and Wildlife Coordination Act (16 U.S.C. 661–666c).

EO 13186 of January 10, 2001 (Federal Register 66(11):3853–3856) directs Federal agencies to support migratory bird conservation and to “ensure that environmental analyses of Federal actions required by the National Environmental Policy Act or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern” (EO 13186, Section 3d(6)). Species of concern are defined as “those species listed in the periodic report *Migratory Nongame Birds of Management Concern in the United States*, priority migratory bird species as documented by established plans (such as Bird Conservation Regions in the North American Bird Conservation Initiative or Partners in Flight physiographic areas), and those species listed in 50 Code of Federal Regulations (CFR) 17.11” (EO 13186, Section 2i). Federal threatened and endangered species are listed in 50 CFR 17.11 and are addressed in the biological assessment (SWCA Environmental Consultants (SWCA) 2012a, 2012b; U.S. Forest Service (Forest Service) 2013).

The Bald and Golden Eagle Protection Act is referenced in the EO, and these species are also listed as migratory species by the U.S. Fish and Wildlife Service (USFWS) (50 CFR Parts 10 and 21, as listed in the Federal Register 75(39):9282–9314, published on March 1, 2010). As bald eagles do not nest in the analysis area, they will not be addressed, but golden eagles have been documented from the proposed analysis area (Russell et al n.d. [1977]; WestLand Resources Inc. 2007). If golden eagles are nesting in the proposed analysis area prior to project disturbance, it may be necessary to obtain Take Permits (see 50 CFR 22.26, as of February 26, 2010).

The EO also requires the establishment of a Memorandum of Understanding (MOU) between the USFWS and other Federal agencies. In 2008 (the latest draft), the Forest Service and USFWS entered into an MOU to promote the conservation of migratory birds with the intent “to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts” (Forest Service 2008:1). The MOU is in the administrative record. Although the agreement does not constitute law, regulation, or policy, it was agreed upon by the Forest Service. Noteworthy entries include the following:

D. THE FOREST SERVICE SHALL:

3. Within the NEPA process, evaluate the effects of agency actions on migratory birds, focusing first on species of management concern¹ along with their priority habitats and key risk factors. To the extent practicable:
 - a. Evaluate and balance long-term benefits of projects against any short- or long-term adverse effects when analyzing, disclosing, and mitigating the effects of management.
 - b. Pursue opportunities to restore or enhance the composition, structure, and juxtaposition of migratory bird habitats in the project area.
 - c. Consider approaches, to the extent practicable, for identifying and minimizing take that is incidental to otherwise lawful activities. (Forest Service 2008:6–7)

There are several examples of approaches for identifying and minimizing “take” (see point D3c, above) in this section, some of which will be discussed below.

The Fish and Wildlife Coordination Act is primarily geared toward empowering and providing funding to state agencies. The species lists referenced in the act are in the document “Birds of Conservation Concern” (USFWS 2008). Because this document targets State agencies, but this is largely a Federal action, the lists were not used in the migratory bird analysis, with the following exception: USFWS (2008) uses Bird Conservation Regions of Partners in Flight (PIF) to provide the lists, and our direction is to use PIF (2006). It should be noted, however, that the Bird Conservation Areas differ between USFWS (2008) and PIF (2006), although most of the species within the same physiographic provinces are the same on both lists.

In order to address the requirements set forth in various Federal laws, regulations, and policies, the Southwestern Regional Office of the Forest Service recommends that the Coronado National Forest (the Coronado) analyze the effects on (1) species lists referred to in EO 13186, (2) Important Bird Areas (IBAs) identified by the National Audubon Society and American Bird Conservancy, and (3) important overwintering sites. This report is an attempt to evaluate the effects, if any, of the proposed project on migratory birds, as well as to recommend measures to minimize or mitigate the effects of the proposed project.

Associated Documents

The evaluation of the effects of the proposed action is being done to meet the requirements of NEPA. Information on plants and animals used for alternative development and disclosures of effects for the environmental impact statement (EIS) is found in a series of biological documents. First, the biologists’ report on the affected environment (SWCA 2013a) establishes and identifies the analysis area, significant biological issues, potentially affected environments, and species to be considered for analysis in the other associated documents. Also, the report discusses the general, holistic effects on plant and animal communities in the proposed analysis area, including those not adequately addressed by the other associated documents (e.g., species not listed in other documents, such as some species of state and county conservation concern).

The other associated documents are as follows: (1) migratory bird analysis (this report), (2) biological assessment (for threatened and endangered species), (3) biological evaluation (for Regional Forester’s and Bureau of Land Management (BLM) Sensitive species), and (4) management indicator species report

¹ This is not defined. Refer to the “Species Identification” section for our interpretation, based on the regulatory framework.

(a Forest Service–specific requirement). Thus, birds are also discussed in all of these documents, but the treatment of effects varies in accordance with the authorities being addressed.

Nomenclature for vegetation communities is not standardized, which often causes confusion for the reader. Table 1 provides the terminology used to describe the vegetation communities for this report, but some of these terms differ from those found in the PIF habitat list and other accounts. The terms in the first column of table 1 were chosen because they more accurately depict the vegetation and abiotic features of the analysis area and are readily linked to published habitat information for plants and animals. Table 1 provides a cross-reference for the terms used by PIF (2006) and Brown (1994), as well as the general terms for studies undertaken by the University of Arizona in the proposed project area (Davis and Callahan n.d. [1977]). Russell et al. (n.d. [1977]) conducted the bird surveys reported within Davis and Callahan (n.d. [1977]), and their terms are slightly different, reflecting their bird survey transects, rather than merely biotic communities. The comments column explains the differences and why this terminology was selected. All species on the PIF list for the Mexican Highlands and Sonoran Desert ecoregions that potentially occur in the project area were considered (i.e., within the elevational bounds and species’ range).

Table 1. Cross-reference of common habitat terms used in this report and other sources

| This Report | Brown (1994) | PIF (2006) | Davis and Callahan (n.d. [1977]) | Comments |
|-----------------------------|---|--|---|---|
| Riparian | Various, but within warm-temperate and/or tropical subtropical wetlands | Riparian | Riparian | Terminology and definitions highly varied; see text for more discussion |
| Madrean evergreen woodland | Madrean evergreen woodland (which includes pine-oak woodland) | Pine-oak woodland (which is same as Madrean evergreen woodland) and pinyon-juniper | Woodland | Analysis area contains mostly oak-dominated woodlands (which include junipers and occasional pinyons) and possibly pine-oak woodlands in far southwestern portion |
| Semidesert grassland | Semidesert grassland | Desert grassland and Chihuahuan desertscrub (PIF also has Sonoran Desert Grassland category) | Grassland | The grassland portions of the project area are not in desert habitat (too much rain to qualify as desert) |
| Sonoran desertscrub | Sonoran desertscrub | Sonoran desert grassland and scrub and Chihuahuan desertscrub | NA | Elements near downstream Davidson Canyon and proposed utility corridors |
| Wetland and aquatic habitat | Warm-temperate wetlands | Riparian | NA | Springs and small artificial waters (e.g., cattle tanks) and vegetation of the immediate surroundings |
| Physical features | NA | Cliff/Rock | Limestone | Physical features include rockslides, talus slopes, cliffs, and mines |
| Chihuahuan desertscrub | Chihuahuan desertscrub | Chihuahuan desertscrub | NA | Limited to uplands surrounding middle Cienega Creek |

Note: NA = Not applicable.

For details regarding the project and analysis areas, project figures, action alternatives, activities associated with the action alternatives, the ecological setting of the affected environment, impacts of alternatives, and mitigation measures, refer to the biologists’ report (SWCA 2013a).

Species Identification

All the migratory bird species that were considered in this report are listed in table 2. The species were selected from the latest version of the online Migratory Nongame Birds of Management Concern in the United States (USFWS 1995 [for USFWS Region 2]) and the national PIF list of priority bird species for Mexican Highlands Ecoregion (PIF 2006). SWCA also did not use the USFWS Birds of Conservation Concern list (USFWS 2008) as referenced in the 2008 MOU between the Forest Service and the USFWS because it relates to the Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901–2911), which addresses Federal assistance to State governments.

The USFWS (1995) list is arranged by administrative region, rather than by ecological community. The PIF (2006) list for the Mexican Highlands Ecoregion lists priority bird species by vegetation type. Because there is no significant standing water in the proposed project area, water birds were filtered out from further consideration. Other species that were categorically excluded include rare migrants and species that do not occur in the proposed project area (i.e., the project area is outside their typical spatial or elevational range). All species that could not be filtered out by these parameters were considered in this evaluation and are analyzed in detail in table 3. For each migratory bird species considered for analysis (i.e., those potentially occurring in or adjacent to the project area), the following characteristics are noted in table 3: the vegetation communities that each species typically uses, the important habitat components present in areas the species typically uses, the expected habitat impacts on that species from the proposed action, and the species' estimated trend in habitat or population resulting from the proposed action.

In addition, as discussed earlier in this document, the golden eagle is analyzed in table 3 and within the “Bald and Golden Eagles” section, as this species has been documented in the proposed project area (Russell et al n.d. [1977]; WestLand Resources Inc. 2007) and is covered under the Bald and Golden Eagle Protection Act. Additionally, in table 3, the effects determinations are listed for each species related to the potential impacts of the action alternatives on the species or its habitat, IBAs, and overwintering areas as required by the MBTA and EO 13186. It has been determined that the no action alternative would result in no impacts to any migratory bird species.

Table 2. Migratory bird species by habitat type

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|--|------------|---|------------------------------------|---------------|----------|-------|--------------------|------|---|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Abert's towhee (<i>Pipilo aberti</i>) | A | RI, SD | RI, CH | × | | | | P | |
| American bittern (<i>Botaurus lentiginosus</i>) | N | | NA | | | × | | | Waterfowl; not known to occur in analysis area |
| American peregrine falcon (<i>Falco peregrinus anatum</i>) | A | CR + all upland types | NA | | | × | | P | |
| Arizona woodpecker (<i>Picoides arizonae</i>) | A | RI, ME | PO | × | | | R | P | |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|--|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|--|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Ash-throated flycatcher (<i>Myiarchus cinerascens</i>) | A | SD, SG, ME | CD | × | | | U/C | CB | |
| Audubon's oriole (<i>Icterus graduacauda</i>) | N | | NA | | | × | | | South Texas only |
| Bachman's sparrow (<i>Aimophila aestivalis</i>) | N | | NA | | | × | | | East Texas and to the east |
| Baird's sparrow (<i>Ammodramus bairdii</i>) | A | SG | NA | | | × | | NA | |
| Bell's vireo (<i>Vireo bellii</i>) | A | RI, SD, SG | RI | × | × | × | U | CB | |
| Bendire's thrasher (<i>Toxostoma bendirei</i>) | A | RI, SD, SG | SG, SD, CD | × | × | × | | CB | |
| Bewick's wren (<i>Thryomanes bewickii</i>) | A | ME, RI, SD, CD, SG | RI | × | | | C/U | CB | |
| Black rail (<i>Laterallus jamaicensis</i>) | N | | WE | | × | × | | | Waterfowl; not known to occur in analysis area |
| Black tern (<i>Chlidonias niger</i>) | N | | N/A | | | × | | | Waterfowl; not known to occur in analysis area |
| Black-chinned hummingbird (<i>Archilochus alexandri</i>) | A | ME, RI, SD, CD, SG | RI | × | | | C | CB | |
| Black-chinned sparrow (<i>Spizella atrogularis</i>) | A | ME, SG | CH, PJ | × | | | C | UB | |
| Black-tailed gnatcatcher (<i>Polioptila melanura</i>) | A | RI, SD, CD, SG | SG, SD, CD | × | × | | R | CB | |
| Black-throated gray warbler (<i>Dendroica nigrescens</i>) | A | ME | CH, PJ | × | | | C | P | |
| Black-throated sparrow (<i>Amphispiza bilineata</i>) | A | SG, SD, CD | CD | × | | × | C | CB | |
| Blackpoll warbler (<i>Dendroica [=Setophaga] striata</i>) | N | | N/A | | | × | | UB | Rare migrant |
| Blue-throated hummingbird (<i>Lampornis clemenciae</i>) | A | probably above ME | RI | × | | | | P | |
| Botteri's sparrow (<i>Aimophila botterii</i>) | A | SG | DG | × | | × | U | CB | |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|--|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|---|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Bridled titmouse (<i>Baeolophus wollweberi</i>) | A | ME, RI | PO | × | | | U | CB | |
| Broad-billed hummingbird (<i>Cyananthus latirostris</i>) | A | RI, SD, ME | RI | × | | | | CB | |
| Brown pelican (<i>Pelecanus occidentalis</i>) | N | | N/A | | | × | | | Waterfowl; not known to occur in analysis area |
| Buff-breasted flycatcher (<i>Empidonax fulvifrons</i>) | N | probably above ME | PO | × | | × | | P | Typically occurs in pine- oak woodlands |
| Cactus ferruginous pygmy-owl (<i>Glaucidium brasilianum cactorum</i>) | A | SD, RI | SG, SD, DG | × | × | × | | UB | |
| Cactus wren (<i>Campylorhynchus brunneicapillus</i>) | A | SD, CD | SG, SD, CD | × | × | | C | CB | |
| Canyon (or brown) towhee (<i>Pipilo fuscus</i>) | A | SD, CD, SG, ME, RI | SG, SD, DG | × | × | | | CB | |
| Canyon wren (<i>Catherpes mexicanus</i>) | A | CR + all upland types | CR | × | | | R/U | P | |
| Cassin's kingbird (<i>Tyrannus vociferans</i>) | A | ME, SG, RI, | RI | × | | | U/R | CB | |
| Cassin's sparrow (<i>Peucaea [=Aimophila] cassinii</i>) | A | SG | DG | × | | × | C | CB | |
| Common black-hawk (<i>Buteogallus anthracinus</i>) | A | RI, CD | NA | | | × | | UB | |
| Common Poorwill (<i>Phalaenoptilus nuttallii</i>) | A | SD, SG, CD, ME | CD | × | | | C | P | |
| Costa's hummingbird (<i>Calypte costae</i>) | A | SD, RI | SG, SD, CD | × | × | × | | P/CB | |
| Crissal thrasher (<i>Toxostoma crissale</i>) | A | RI, SG | RI, CD | × | × | | C/U | P | |
| Curve-billed thrasher (<i>Toxostoma curvirostre</i>) | A | SD, SG | SG, SD, CD | × | × | × | R | CB | |
| Eared quetzal (<i>Euptilotis neoxenus</i>) | N | | RI | × | | | | UB | Rare migrant |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|---|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|-------------------------------|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Elf owl (<i>Micrathene whitneyi</i>) | A | RI, ME, SD | SG, SD, CD | × | × | | C | CB | |
| Ferruginous hawk (<i>Buteo regalis</i>) | A | winter foraging | NA | | | × | | UB | |
| Field sparrow (<i>Spizella pusilla</i>) | N | | NA | | | × | | NA | Rare migrant |
| Five-striped sparrow (<i>Aimophila quinquestriata</i>) | A | SG, RI | DG | × | | | | UB | |
| Flammulated owl (<i>Otus flammeolus</i>) | N | | PF, SF | × | | | | | High elevation only |
| Gambel's quail (<i>Callipepla gambelii</i>) | A | SD, CD, SG, RI | SG, SD, CD | × | × | | R | CB | |
| Gila woodpecker (<i>Melanerpes uropygialis</i>) | A | SD, SG, ME, RI | SG, SD, CD | × | × | × | U/R | CB | |
| Gilded flicker (<i>Colaptes chrysoides</i>) | A | SD | SG, SD | | × | | | CB | |
| Golden eagle (<i>Aquila chrysaetos</i>) | A | SD, SG, ME, RI | NA | | | | | P | |
| Grace's warbler (<i>Dendroica graciae</i>) | A | | PO | × | | | | | |
| Grasshopper sparrow (<i>Ammodramus savannarum</i>) | A | SG | NA | | | × | | CB | |
| Gray flycatcher (<i>Empidonax wrightii</i>) | A | | NA | | | × | U | UB | |
| Gray vireo (<i>Vireo vicinior</i>) | N | | CH, PJ | × | | × | | | Outside natural range |
| Greater pewee (<i>Contopus pertinax</i>) | N | | PF, SF | × | | | | P | High elevation only |
| Greater roadrunner (<i>Geococcyx californianus</i>) | A | SD, CD, SG, ME | CD | × | | | R | CB | |
| Henslow's sparrow (<i>Ammodramus henslowii</i>) | N | | NA | | | × | | | East Texas and to the east |
| Hepatic tanager (<i>Piranga flava</i>) | A | SD, ME, RI | RI | × | | | R | P | |
| Hooded oriole (<i>Icterus cucullatus</i>) | A | RI, ME | RI | × | × | | R | CB | |
| Hutton's vireo (<i>Vireo huttoni</i>) | A | ME | PO | × | | | R | P | |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|--|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|--|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Inca dove (<i>Columbina inca</i>) | A | SG, SD | SG, SD | | × | | | UB | |
| Ladder-backed woodpecker (<i>Picoides scalaris</i>) | A | SD, SG, ME, CD, RI | CD | × | | | U | P/CB | |
| Lark sparrow (<i>Chondestes grammacus</i>) | A | SG, ME, SD | N/A | | | × | C | P | |
| Least bittern (<i>Ixobrychus exilis</i>) | N | | N/A | | | × | | | Waterfowl; not known to occur in analysis area |
| Least grebe (<i>Tachybaptus dominicus</i>) | N | | N/A | | | × | | | Waterfowl; not known to occur in analysis area |
| LeConte's thrasher (<i>Toxostoma lecontei</i>) | N | | SG, SD | | × | | | | Far western deserts only |
| Loggerhead shrike (<i>Lanius ludovicianus</i>) | A | SD, SG | NA | | | × | R/U | CB | |
| Lucifer hummingbird (<i>Calothorax lucifer</i>) | A | SG, RI, ME, SD | CD | × | | × | | P | |
| Lucy's warbler (<i>Vermivora luciae</i>) | A | SD, RI, SG | RI | × | × | × | C | CB | |
| Mexican chickadee (<i>Poecile sclateri</i>) | N | | PF, SF | × | | | | | Only in Chiricahua Mountains in Arizona |
| Mexican jay (<i>Aphelocoma [A. wollveberi] ultramarina</i>) | A | ME, RI | PO | × | | | C | CB | |
| Mexican spotted owl (<i>Strix occidentalis lucida</i>) | N | Probably above ME | PO | × | | × | | UB | Discussed further in Biological Evaluation (SWCA 2013) and Biological Assessment (SWCA 2012a, 2012b; U.S. Forest Service and SWCA 2013) |
| Mountain plover (<i>Charadrius montanus</i>) | N | | NA | | | × | | | Rare migrant to agricultural fields |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|--|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|--|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Northern beardless-tyrannulet (<i>Camptostoma imberbe</i>) | A | RI, SD, CD | RI | × | | × | R | CB | |
| Northern goshawk (<i>Accipiter gentilis</i>) | N | | NA | | | × | | | High elevation only |
| Northern gray hawk (<i>Buteo nitida maximus</i>) | A | RI, CD | NA | | | × | | CB | |
| Northern harrier (<i>Circus cyaneus</i>) | A | SG | NA | | | × | R | UB/P | |
| Olive sparrow (<i>Arremonops rufivirgatus</i>) | N | | NA | | | × | | | South Texas only |
| Olive warbler (<i>Peucedramus taeniatus</i>) | N | | PF, SF | × | | | | | High elevation only |
| Painted bunting (<i>Passerina ciris</i>) | A | | NA | | | × | | | |
| Painted redstart (<i>Myioborus pictus</i>) | A | RI, ME | PO | × | | | R | CB | |
| Phainopepla (<i>Phainopepla nitens</i>) | A | SD, SG, RI | RI | × | × | | U | CB | |
| Prairie warbler (<i>Dendroica</i> [= <i>Setophaga</i>] <i>discolor</i>) | N | | NA | | | × | | | Outside natural range |
| Reddish egret (<i>Egretta rufescens</i>) | N | | NA | | | × | | | Waterfowl; not known to occur in analysis area |
| Red-faced warbler (<i>Cardellina rubrifrons</i>) | A | | PF, SF | × | | | | | |
| Red-headed woodpecker (<i>Melanerpes erythrocephalus</i>) | N | | NA | | | × | | | Outside natural range |
| Rufous-winged sparrow (<i>Aimophila carpalis</i>) | A | SD | RI, DG | × | × | | R/U | CB | |
| Sage sparrow (<i>Amphispiza belli</i>) | N | | NA | | | × | | | Outside natural range |
| Scaled quail (<i>Callipepla squamata</i>) | A | CD, SG | CD | × | | | | CB | |
| Scott's oriole (<i>Icterus parisorum</i>) | A | SD, CD, SG, ME, RI | PO | × | | | U | CB | |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|---|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|--|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Snowy plover (<i>Charadrius alexandrinus</i> [= <i>C. nivosus</i>]) | N | | NA | | | × | | | Rare migrant valleys |
| Southwestern willow flycatcher (<i>Empidonax traillii</i> <i>extimus</i>) | N | SD, RI | RI | × | × | | | CB | Discussed further in Biological Evaluation (SWCA 2013) and Biological Assessment (SWCA 2012a, 2012b; U.S. Forest Service and SWCA 2013) |
| Swainson's hawk (<i>Buteo swainsoni</i>) | A | SG, CD | DG | × | | | | UB | |
| Thick-billed kingbird (<i>Tyrannus</i> <i>crassirostris</i>) | N | RI, SD, SG | RI | × | | | | UB | Outside geographic range |
| Tropical parula (<i>Parula</i> [=Setophaga] <i>pitiayumi</i>) | N | | NA | | | × | | | Outside natural range |
| Varied bunting (<i>Passerina versicolor</i>) | A | RI, SD, CD, SG | RI | × | | | R | CB | |
| Veery (<i>Catharus fuscescens</i>) | N | | NA | | | × | | | Outside natural range |
| Verdin (<i>Auriparus flaviceps</i>) | A | SD, SG, RI | SG, SD, CD | × | × | | U/C | CB | |
| Vermilion flycatcher (<i>Pyrocephalus rubinus</i>) | A | RI, SD, SG | NA | | | × | R | CB | |
| Virginia's warbler (<i>Oreothlypis</i> [= <i>Vermivora</i>] <i>virginiae</i>) | A | ME, RI | PO | × | × | × | R | UB | |
| Western burrowing owl (<i>Athene cunicularia</i> <i>hypugaea</i>) | A | SD, CD | SG, SD, CD | | × | × | | UB | |
| Western screech-owl (<i>Megascops</i> [=Otus] <i>kennicottii</i>) | A | RI, SD, SG, ME | SG, SD | | × | | C | P | |

| Species (Scientific Name) | Evaluation | Habitat (As Defined in This Report) | Habitat (PIF Classification) | Species Lists | | | Abundance Codes | | Exclusion Justification |
|--|------------|---|------------------------------------|---------------|-------|-------|--------------------|------|--|
| | | | | PA 81 | PA 82 | USFWS | RMS | CW-G | |
| Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>) | N | SD, SG, RI | RI | × | × | × | R | CB | Discussed further in Biological Evaluation (SWCA 2013) and Biological Assessment (SWCA 2012a, 2012b; U.S. Forest Service and SWCA 2013) |
| Whiskered screech-owl (<i>Megascops [=Otus] trichopsis</i>) | A | ME, RI | PO | × | | | | UB | |
| White-faced ibis (<i>Plegadis chihi</i>) | N | | NA | | | × | | | Waterfowl; not known to occur in analysis area |
| White-throated swift (<i>Aeronautes saxatalis</i>) | A | CR, SD, ME | CR | × | | | U | P | |
| Wilson's plover (<i>Charadrius wilsonia</i>) | N | | NA | | | × | | | Coastal shorebird |
| Worm-eating warbler (<i>Helmitheros vermivorus</i>) | N | | NA | | | × | | | Outside natural range |
| Yellow-eyed junco (<i>Junco phaeonotus</i>) | A | SG, ME | PF, SF | × | | | U/C | UB | |
| Yuma clapper rail (<i>Rallus longirostris yumanensis</i>) | N | | WE | | × | | | | Waterfowl; outside natural range |

Notes: Based on PIF (2006) and USFWS (1995).

Justification for exclusion from analysis in the migratory bird analysis is based on Corman and Wise-Gervais (2005); CW-G in table heading, Russell, Mills, and Silliman (n.d. [1977]); RMS in table heading. Species that are categorically excluded are waterfowl (i.e., no habitat), rare migrants, and species that do not occur in the proposed project area (outside spatial or elevational range). Codes are shown following this table.

Sources: CW-G = Corman and Wise-Gervais (2005); PIF = Partners in Flight (2006); RMS = Russell, Mills, and Silliman (n.d. [1977]).

Evaluation: A = Analyzed in detail within the migratory bird report; N=Not analyzed in detail within the migratory bird report
Lists: PA 81 = Physiographic Area 81, Sonoran (PIF); PA 82 = Physiographic Area 82, Mexican Highland (PIF); USFWS = U.S. Fish and Wildlife Service (1995)

| <u>Habitat (this report classification):</u> | <u>Habitat (PIF classification)</u> | <u>Abundance Codes</u> |
|--|-------------------------------------|---|
| CD=Chihuahuan Desertscrub | CD=Chihuahuan Desertscrub | C=Common, abundant |
| CR=Cliff/rock portion of physical features | CH=Chaparral | U=Uncommon |
| ME=Madrean Evergreen Woodland | CR=Cliff/Rock | R=Rare |
| RI=Riparian | DG=Desert Grassland | CB=Confirmed breeding locally or nearby |
| SD=Sonoran Desertscrub | PF=Pine-Fir | UB=Unconfirmed breeding occurrence locally or nearby (but possible) |
| SG=Semidesert Grassland | PJ=Pinyon-Juniper | P=Possible or probable breeding locally or nearby (no entry=the species was not detected) |
| | PO=Pine/Oak | |
| | RI=Riparian | |
| | SD=Sonoran Desertscrub | |
| | SF=Spruce-Fir | |
| | SG=Sonoran Desert Grassland | |
| | WE=Wetland | |
| | NA=not applicable | |

Table 3. Potential impacts from the action alternatives on migratory bird habitat

Range or habitat information is from Arizona Game and Fish Department (2013); Corman and Wise-Gervais (2005); Cornell Lab of Ornithology and American Ornithologists' Union (2013); Cornell Lab of Ornithology (2013); eBird (2013e); and Russell et al. (n.d. [1977]).

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|--|--|
| Abert's towhee* (<i>Pipilo aberti</i>) | Lowland riparian thickets and dense growth of dry desert washes | Dense understory and damp soil; typically associated with seep willow, cottonwood-willow, and mesquite | May be impacted. Direct impacts on the Abert's towhee are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Suitable habitat (lowland riparian thickets that contain mesquite) exists in the project area and analysis areas and would be lost or altered. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on State Route (SR) 83 and other roads. Additional impacts could occur on Abert's towhee populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Indirect impacts could also result from prey species experiencing the same impacts from proposed project activities, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in lowland desert dry washes and cottonwood-willow riparian woodlands, areas that would not be directly impacted by this project. |
| American peregrine falcon (<i>Falco peregrinus anatum</i>) | No specific vegetation types; found where steep cliffs and canyon walls are present | Nests in areas with rocky, steep, cliffs, usually near water where prey is abundant. More than 1,650 breeding pairs in the United States and Canada. | Unknown impact. May occur as a migrant or during winter months. Cliffs providing nesting and roosting sites occur adjacent to the project area; however, Direct impacts on the American peregrine falcon are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species of the American peregrine falcon could experience the same impacts as the falcon, hence altering their predator-prey relationships. Population-level impacts are not expected. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|--|---|---|
| <p>Arizona woodpecker* (<i>Picoides arizonae</i>)</p> | <p>Madrean oak and pine-oak woodlands, riparian woodlands, mountain canyons, and drainages dominated by oaks and sycamores (<i>Platanus</i> sp.)</p> | <p>Occur in several forested habitats dominated by Madrean evergreen oaks, including stringers of oaks fingering through dry desert riparian washes into grasslands</p> | <p>May be impacted. Suitable habitat (oaks fingering through washes interspersed with grassland) exists in the project and analysis areas, and Madrean evergreen oak woodland habitat would be lost or altered as a result of this project. Direct impacts on the Arizona woodpecker are not anticipated as a result of the proposed project because there are highly mobile and will likely avoid disturbance areas, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Population-level impacts are not expected for this species because hundreds of thousands of acres of alternative habitat are available outside the proposed project area.</p> |
| <p>Ash-throated flycatcher* (<i>Myiarchus cinerascens</i>)</p> | <p>Common in arid and semi-arid landscapes from lowland deserts and riparian woodlands to pinyon-pine and juniper</p> | <p>Primarily found in open country, offering scattered trees or structures providing nest cavities; prefers Sonoran desertscrub</p> | <p>May be impacted. Suitable habitat (riparian areas within juniper-oak woodland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this habitat generalist is widespread across southeastern Arizona and the project area is not expected to contain a large amount of suitable nest cavities.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|--|--|
| Baird's sparrow* (<i>Ammodramus bairdii</i>) | Desert and semidesert grassland | Rolling grasslands with bunchgrasses and no canopy, at elevations between 3,000 and 5,000 feet | May be impacted. Suitable habitat (rolling grasslands and south-facing slopes of mixed-oak grassland) exists in the analysis area and would be lost or altered. Direct impacts on the Baird's sparrow are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species appears to only use the area sporadically. |
| Bell's vireo* (<i>Vireo bellii</i>) | Mesquite bosques, heavily wooded desert washes with cottonwood-willow and well-developed understory | Dense, shrubby vegetation and woodland edges; typically with mesquite present and perennial or intermittent drainages nearby | May be impacted. Suitable habitat (dense, shrubby riparian vegetation with mesquite present) exists in the analysis area and would be lost or altered. Direct impacts on the Bell's vireo are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed near perennial or intermittent drainages with remnant cottonwood-willow stands, areas that would not be directly impacted by this project. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|---|---|---|
| <p>Bendire's thrasher* (<i>Toxostoma bendirei</i>)</p> | <p>Most commonly observed in Sonoran desertscrub, dry desert washes, and semidesert grasslands</p> | <p>Typically favors an abundance of trees, shrubs, and cacti adjacent to open areas; frequently along dry desert washes</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project area, and areas to be potentially impacted by the utility corridor would be lost or altered. Direct impacts on the Bendire's thrasher are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this habitat generalist is widespread across southeastern Arizona and prefers Sonoran desertscrub, which would not be impacted significantly by this project.</p> |
| <p>Bewick's wren* (<i>Thryomanes bewickii</i>)</p> | <p>Pinyon-juniper woodlands scattered with ponderosa pine, grasslands scattered with junipers, and riparian woodlands</p> | <p>Canyons and foothill drainages with sycamore and lowland drainages with cottonwood-willow and mesquite</p> | <p>May be impacted. Suitable habitat (grasslands scattered with junipers) exists in the analysis area and would be lost or altered. Direct impacts on the Bewick's wren could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southeastern Arizona and prefers pinyon-juniper woodlands.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|---|--|---|
| <p>Black-chinned hummingbird* (<i>Archilochus alexandri</i>)</p> | <p>Pinyon-juniper, oak-juniper, and chaparral; typically observed in canyons or wooded drainages</p> | <p>Habitat generalists that breed in a variety of vegetation types; highest densities in riparian areas</p> | <p>May be impacted. Suitable habitat (oak/juniper) exists in the analysis area and would be lost or altered. Direct impacts on the black-chinned hummingbird are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southeastern Arizona and prefers pinyon-juniper and deciduous riparian woodlands.</p> |
| <p>Black-chinned sparrow* (<i>Spizella atrogularis</i>)</p> | <p>Interior chaparral, pinyon pine-juniper and Madrean evergreen oak woodlands, and semidesert grasslands</p> | <p>Highest densities observed on steep mountain slopes and remote ridges covered with dense chaparral vegetation</p> | <p>May be impacted. Suitable habitat (semidesert grassland and chaparral vegetation within understorey of Madrean evergreen oak woodland) exists in the analysis area and would be lost or altered. Direct impacts on the black-chinned sparrow of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this habitat generalist is widespread across southeastern Arizona and prefers interior chaparral vegetation.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|--|---|
| <p>Black-tailed gnatcatcher* (<i>Poliopitila melanura</i>)</p> | <p>Commonly observed in Sonoran, Mojave, and Chihuahuan desertscrub and dry desert washes</p> | <p>Prefer arid lowlands with brushy cover, especially thorny shrubs, legume trees, and cacti</p> | <p>May be impacted. Suitable habitat (elements of Sonoran desertscrub) exists in areas to be potentially impacted by the utility corridor and would be lost or altered. Direct impacts on the black-tailed gnatcatcher are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southeastern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |
| <p>Black-throated gray warbler* (<i>Dendroica nigrescens</i>)</p> | <p>Pinyon pine-juniper, Madrean evergreen oak, and mixed ponderosa pine woodlands</p> | <p>Habitat specifics appear to be mostly unknown, but regularly favor open woodlands</p> | <p>May be impacted. Suitable habitat (Madrean evergreen oak woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the black-tailed gnatcatcher are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species typically prefers pinyon pine-juniper woodlands, which would not be impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|--|--|--|
| Black-throated sparrow* <i>(Amphispiza bilineata)</i> | Commonly observed in Sonoran, Mojave, Chihuahuan, and cold-temperate desertscrub and semidesert grasslands | Prefer open, arid country in a variety of low to mid-elevation shrubby habitats | May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the black-throated sparrow may occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this habitat generalist is widespread across Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project. |
| Blue-throated hummingbird <i>(Lampornis clemenciae)</i> | Madrean pine-oak and Madrean evergreen woodlands | Highest densities in riparian areas, where sycamore-dominated drainages connect to Madrean pine-oak forest | May be impacted. Suitable habitat (riparian areas within Madrean evergreen woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the blue-throated hummingbird are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flows in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected since sycamore-dominated drainages interspersed with pine-oak forests, areas typically used by this species, are not prevalent in areas that would potentially be impacted by this project. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|---|--|---|
| <p>Botteri's sparrow* (<i>Aimophila botterii</i>)</p> | <p>Desert and semidesert grassland</p> | <p>Bajadas and floodplains with tall bunchgrasses and shrubs that provide dense ground cover</p> | <p>May be impacted. Suitable habitat (semidesert grassland with tall bunchgrasses and shrubs) exists in the analysis area would be lost or altered. Direct impacts on the Botteri's sparrow are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flows in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because it is unknown whether this species currently uses the project area; however, this species is highly susceptible to loss or alteration of grassland habitats.</p> |
| <p>Bridled titmouse* (<i>Baeolophus inornatus</i>)</p> | <p>Madrean evergreen oak woodlands, canyons and foothill drainages, and tall riparian woodlands</p> | <p>Highest densities typically found in or near Madrean evergreen oak associations</p> | <p>May be impacted. Suitable habitat (Madrean evergreen and oak woodland) exists in the project and analysis areas and would be lost or altered as a result of this project. Direct impacts on the bridled titmouse could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts may be expected for this species. This species favors oak woodlands and the surrounding canyon and foothills drainages, vegetation types that would be removed or altered in large quantities by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|--|---|---|
| Broad-billed hummingbird* (<i>Cyananthus latirostris</i>) | Broadleaf riparian woodlands and Madrean evergreen woodlands | Riparian areas among sycamores, cottonwoods, evergreen oaks, alligator-bark juniper, and mesquite | <p>May be impacted. Suitable habitat (riparian areas within Madrean evergreen woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the broad-billed hummingbird are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected since sycamore- and cottonwood-dominated drainages, areas typically used by this species, are only present downstream of areas to be impacted by this project.</p> |
| Cactus ferruginous pygmy-owl (<i>Glaucidium brasilianum cactorum</i>) | Arizona Upland subdivision of Sonoran desertscrub | Diversity of species and structure with well-developed understory, mid-story, and canopy layers below 4,000 feet amsl | <p>Unknown impact. Most of the analysis area is above 4,000 feet amsl, except for a small portion of the utility corridor and areas downstream. Although portions of the utility corridor contain elements of Sonoran desertscrub, most project impacts will occur above the elevational range typically used by this species. Hence, direct impacts are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|---|---|--|
| <p>Cactus wren* (<i>Campylorhynchus brunneicapillus</i>)</p> | <p>Inhabit all desertscrub associations, semidesert grasslands, and dry desert washes</p> | <p>Primarily inhabit arid regions containing an abundance of cholla</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the cactus wren could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southeastern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |
| <p>Canyon (or brown) towhee* (<i>Pipilo fuscus</i>)</p> | <p>Arizona Upland, Sonoran desertscrub, dry desert washes, and semidesert grasslands</p> | <p>Typically observed in characteristically arid and brushy habitats with an abundance of trees, cacti, and dense, shrubby ground cover</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the canyon towhee could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southeastern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|---|--|--|
| <p>Canyon wren* (<i>Catherpes mexicanus</i>)</p> | <p>No specific vegetation types; found in steep canyons, cliffs, rocky outcrops, and ridgelines</p> | <p>Found where topography provides appropriate substrates for foraging and nesting; steep slopes and canyons</p> | <p>May be impacted. Suitable habitat (steep slopes and canyons) exists in the analysis area, but these areas would not be impacted significantly by the proposed action. Direct impacts on the canyon wren are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flows in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected.</p> |
| <p>Cassin's kingbird* (<i>Tyrannus vociferans</i>)</p> | <p>Typically found in pinyon-juniper woodlands and adjacent grasslands</p> | <p>Require good cover interspersed with open areas for foraging; otherwise, they are habitat generalists</p> | <p>May be impacted. Suitable habitat (grassland interspersed with juniper woodland) exists in the analysis area and would be lost or altered. Direct impacts on the Cassin's kingbird are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southeastern Arizona and is typically observed in pinyon-juniper woodlands.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|--|---|--|
| Cassin's sparrow* (<i>Peucaea [=Aimophila] cassinii</i>) | Desert and semidesert grassland | Tall mature, native grasses, shrubs, and scattered mesquite, providing significant ground cover | May be impacted. Suitable habitat (grassland interspersed with mesquite) exists in the project and analysis areas and would be lost or altered as a result of this project. Direct impacts on the Cassin's sparrow are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected. |
| Common black-hawk* (<i>Buteogallus anthracinus</i>) | Mature gallery forests along perennial streams | Nests in large trees (mostly sycamores and cottonwoods) found in groves | May be impacted. The mine footprint does not contain mature gallery forest. Direct impacts on the common black-hawk are not anticipated as a result of the proposed project or the construction of the connected actions because there are no known occurrences of this species within these areas. The reroute of the Arizona National Scenic Trail for all action alternatives, however, would put the trail closer to a known common black-hawk nest in Mulberry Canyon. The common black-hawks nesting in this area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on common black-hawk populations located within the analysis area in Cienega Creek where groundwater drawdown is modeled to occur as a result of all action alternatives. Further, the construction and use of the rerouted Arizona National Scenic Trail could result in additional noise impacts to this species. Indirect impacts could also result from prey species experiencing the same impacts from proposed project activities, hence altering their predator-prey relationships. Population-level impacts are not expected. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| Common poorwill (<i>Phalaenoptilus nuttallii</i>) | Arizona Upland, Sonoran desertscrub, semidesert grasslands, and pinyon pine-juniper | Typically observed in a wide range of arid and semi-arid communities, usually in rocky, sloping terrain | May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the common poorwill are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flows in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across Arizona, likely more abundant than previously thought as a result of cryptic daytime behavior, and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project. |
| Costa's hummingbird* (<i>Calypte costae</i>) | Sonoran desertscrub, dry desert washes, and deciduous riparian woodlands | Prefer dry washes, canyons, and rocky slopes with an abundance of paloverde, mesquite, ironwood, acacia, creosote, ocotillo, jojoba, and saguaro | May be impacted. Suitable habitat (elements of Sonoran desertscrub) exists in areas to be potentially impacted by the project and would be lost or altered. Direct impacts on the Costa's hummingbird are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flows in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Crissal thrasher* (<i>Toxostoma crissale</i>)</p> | <p>Dry desert and deciduous riparian washes, interior chaparral, Sonoran deserts, semidesert grasslands, and pinyon pine-juniper</p> | <p>Prefer tall, dense brush and shrub thickets; heavily vegetated dry washes in open deserts; and lower mountain foothill drainages and canyons</p> | <p>May be impacted. Suitable habitat (semidesert grassland, elements of Sonoran deserts, and dry desert washes) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Crissal thrasher could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers low-elevation dry desert washes and Sonoran deserts scrub vegetation, which would not be impacted significantly by this project.</p> |
| <p>Curve-billed thrasher* (<i>Toxostoma curvirostre</i>)</p> | <p>Sonoran deserts, semidesert grasslands, dry desert washes, and urban areas</p> | <p>Typically desert inhabitants known to frequent many urban settings; prefer cholla or prickly pear/thorny shrub associations</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran deserts) exists in the project and analysis areas and would be lost or altered. Direct impacts on the curve-billed thrasher are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran deserts scrub vegetation, which would not be impacted significantly by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| Elf owl (<i>Micrathene whitneyi</i>) | Arizona Upland, Sonoran desertscrub, and various riparian habitats | Typically occur in cavity-rich areas with numerous saguaros, scattered thorny trees, and other types of woody vegetation | May be impacted. Suitable habitat (riparian areas and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the elf owl are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project. |
| Ferruginous hawk* (<i>Buteo regalis</i>) | No specific vegetation types; winter residents across most of Arizona | Typically prefer cold temperate and Plains grasslands and desertscrub for breeding, but winter over much of Arizona in various habitats | May be impacted. This species may forage over this area in the winter, and suitable foraging habitat would be lost or altered. Direct impacts on the ferruginous hawk are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Population-level impacts are not expected because this species does not breed in southern Arizona. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Five-striped sparrow (<i>Aimophila quinquestrigata</i>)</p> | <p>Sonoran desertscrub and semidesert grassland</p> | <p>Tall, dense, and often thorny brush with scattered grasses and forbs, typically on steep, arid hillsides and slopes, usually near permanent water</p> | <p>May be impacted. Suitable habitat (grassland interspersed with tall, dense thorny shrubs) exists in the project and analysis areas and would be lost or altered. Direct impacts on the five-striped sparrow are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in a mixture of semidesert grassland and Sonoran desertscrub vegetation in southern Arizona, areas that would not be impacted significantly by this project.</p> |
| <p>Gambel's quail* (<i>Callipepla gambelii</i>)</p> | <p>Sonoran desertscrub, dry desert washes, semidesert grasslands, and urban areas</p> | <p>Favors river valleys and brushy washes in desertscrub communities, especially those with an abundance of thorny legume trees, shrubs, saguaros, and other cacti</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Gambel's quail are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Gila woodpecker* (<i>Melanerpes uropygialis</i>)</p> | <p>Sonoran desertscrub, various riparian habitats, semidesert grasslands, and urban areas</p> | <p>Typically inhabit Sonoran desert lands with tall saguaro, paloverde, mesquite, and ironwood, and wooded drainages</p> | <p>May be impacted. Suitable habitat (semidesert grasslands, riparian areas, and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Gila woodpecker could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |
| <p>Gilded flicker* (<i>Colaptes chrysoides</i>)</p> | <p>Sonoran desertscrub, various desert riparian habitats, semidesert grasslands, and urban areas</p> | <p>Typically associated with areas of Sonoran desertscrub containing a high density of saguaros, especially in the Arizona uplands</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the gilded flicker are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Golden eagle* (<i>Aquila chrysaetos</i>)</p> | <p>Pinyon pine-juniper and Madrean evergreen woodlands, Sonoran and cold-temperate deserts, scrub, and semidesert grasslands</p> | <p>Although known to nest in a wide variety of Arizona habitats, topography usually includes tall cliffs or canyons suitable for nests and nearby large, open areas to forage for prey</p> | <p>May be impacted. Suitable habitat (Madrean evergreen woodland, semidesert grassland, and elements of Sonoran deserts) exists in the project and analysis areas and would be lost or altered. Direct impacts on the golden eagle are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Population-level impacts are not expected because this species uses a diverse range of habitat types and typically prefers pinyon pine-juniper woodlands, which would not be impacted by this project.</p> |
| <p>Grace's warbler* (<i>Dendroica graciae</i>)</p> | <p>Primarily montane conifer forests, but also pine-oak, oak, or pinyon-juniper woodlands</p> | <p>Most likely to be found in riparian areas or areas with park-like stands of mature trees; favor open conifer forests</p> | <p>Unknown impact. Some suitable habitat (riparian areas within Madrean evergreen woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Grace's warbler are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because the majority of all observations of this species are in vegetation communities that contain some element of ponderosa pine.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Grasshopper sparrow (<i>Ammodramus savannarum</i>)</p> | <p>Desert and semidesert grassland</p> | <p>Bunchgrasses providing thick ground cover with no canopy at elevations between 3,000 and 5,000 feet amsl</p> | <p>May be impacted. Suitable semiarid grassland habitat (bunchgrasses providing thick ground cover with no canopy) exists in small amounts in the analysis area. Small chunks of suitable grassland habitat would be removed or altered as a result of this proposed project. Direct impacts are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species prefers large, continuous expanses of grasslands of intermediate height.</p> |
| <p>Gray flycatcher* (<i>Empidonax wrightii</i>)</p> | <p>Primarily pinyon pine– juniper woodlands, but also tall sagebrush/greasewood plains, and open Ponderosa or Jeffrey pine forests with pinyon and/or juniper understory</p> | <p>In Arizona, most common in larger and taller stands of pinyon pine and/or juniper with open understory sometimes with sagebrush, cliffrose, and barberry; may need some ground cover to support insect populations for forage</p> | <p>May be impacted. Some suitable habitat (some pinyon pine and juniper species) exists in the project and analysis areas and would be lost or altered. Direct impacts on the gray flycatcher could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across the western United States and prefers primarily pinyon pine-juniper forests, which would not be significantly impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Greater roadrunner* (<i>Geococcyx californianus</i>)</p> | <p>Sonoran desertscrub, dry desert washes, semidesert grasslands, and rural and urban areas</p> | <p>Frequently observed in open, arid country with scattered cacti, shrubs (creosotebush), or low trees (mesquite, paloverde, and ironwood)</p> | <p>May be impacted. Suitable habitat (semidesert grassland and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the greater roadrunner could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub vegetation, which would not be impacted significantly by this project.</p> |
| <p>Hepatic tanager* (<i>Piranga flava</i>)</p> | <p>From pine-oak woodlands to montane conifer forests</p> | <p>Found in terrestrial and riparian situations of both open and closed stands</p> | <p>May be impacted. The project area does not contain stands of pine-oak or conifer. Direct impacts on the hepatic tanager are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species typically occurs in pine-oak woodlands and montane conifer forests.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|---|---|
| <p>Hooded oriole* (<i>Icterus cucullatus</i>)</p> | <p>Desert grasslands, semidesert grasslands, and Madrean encinal woodland</p> | <p>Found in riparian areas associated with broadleaf deciduous trees</p> | <p>May be impacted. Suitable habitat (riparian areas in semidesert grassland and Madrean woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the hooded oriole could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in lowland desert dry washes; foothills drainages dominated by sycamore, walnut, and ash; and cottonwood-willow riparian woodlands, areas that would not be directly impacted by this project.</p> |
| <p>Hutton's vireo* (<i>Vireo huttoni</i>)</p> | <p>Madrean evergreen oak and pine-oak woodlands, adjacent foothill drainages, and mountain canyon bottoms</p> | <p>Associated with evergreen oaks and tall, continuously canopied woodlands with large oaks and shade</p> | <p>May be impacted. Suitable habitat (Madrean evergreen woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Hutton's vireo could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species typically prefers habitat that is not readily present in areas that would be impacted by this proposed project (i.e., tall, continuously canopied stands of Madrean evergreen oak and pine-oak woodlands).</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|--|---|
| <p>Inca dove* (<i>Columbina inca</i>)</p> | <p>Residential, rural and urban; parks; Arizona Upland, Sonoran desertscrub; and lowland riparian areas</p> | <p>This species is strongly associated with urban and rural settings; often found nesting in city parks and backyards</p> | <p>May be impacted. Suitable habitat (elements of Sonoran desertscrub) exists in the analysis area and would be lost or altered. Direct impacts on the Inca dove are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Population-level impacts are not expected because the Inca dove prefers developed areas in Arizona; thus, this project may even benefit this species.</p> |
| <p>Ladder-backed* woodpecker (<i>Picoides scalaris</i>)</p> | <p>Sonoran desertscrub, various dry and deciduous riparian areas, and semidesert grasslands</p> | <p>Typically observed in low- to mid-elevation habitats with an abundance of tree or similar-sized trunks for nesting cavities</p> | <p>May be impacted. Suitable habitat (semidesert grasslands, riparian areas, and elements of Sonoran desertscrub) exists in the project and analysis areas and would be removed or altered. Direct impacts on the ladder-backed woodpecker could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub and dry desert washes, which would not be impacted significantly by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Lark sparrow* (<i>Chondestes grammacus</i>)</p> | <p>Cold temperate grasslands and desertscrub; semidesert grasslands; pinyon pine-juniper woodlands</p> | <p>This species favors open country with scattered trees and low shrubs, typically along woodland edges</p> | <p>May be impacted. Habitat (Madrean evergreen woodlands and semidesert grasslands) exists in the project and analysis areas and would be lost or altered. Direct impacts on the lark sparrow could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Population-level impacts are not expected because the analysis area is at the edge of the widespread range of occupied habitat for this species within Arizona.</p> |
| <p>Loggerhead shrike* (<i>Lanius ludovicianus</i>)</p> | <p>Sonoran desertscrub, semidesert grasslands, juniper woodlands, and adjacent cold-temperate grasslands and desertscrub</p> | <p>Found in a variety of open and relatively flat to gently rolling habitats, typically with thorny trees and shrubs</p> | <p>May be impacted. Suitable habitat (Sonoran desertscrub and semidesert grassland vegetation types) are present within the project and analysis areas and would be lost or altered. Direct impacts on the loggerhead shrike could occur as a result of the proposed project because there are known occurrences of this species within the project area. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across Arizona and is typically observed in Sonoran desertscrub and juniper woodlands, which would not or would minimally be impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|---|---|--|
| Lucifer hummingbird (<i>Calothorax lucifer</i>) | Sonoran desertscrub, riparian, desert and semidesert grasslands, and Madrean woodland | Prefers open, arid landscapes, especially where there are scattered agaves, yuccas, and ocotillos | <p>May be impacted. It is found principally in sparsely vegetated rock canyon slopes, foothill washes, and dry woodland edges, but has been reported in mountain foothills with scattered oaks, and suitable habitat would be lost or altered. Direct impacts on the Lucifer hummingbird are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in open, arid landscape areas that would not be directly impacted by this project.</p> |
| Lucy's warbler* (<i>Vermivora luciae</i>) | Desert and semidesert grassland | Thickets along streams, such as mesquite bosques and hardwoods | <p>May be impacted. Suitable habitat (thickets along streams within semi-desert grassland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Lucy's warbler are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in lowland desert dry washes, Sonoran desertscrub, mesquite bosque, and dense cottonwood-willow riparian woodlands, areas that would be minimally impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Mexican jay (<i>Aphelocoma ultramarina</i> [<i>A. wollweberi</i>])</p> | <p>Oak woodland</p> | <p>Pine, oak, and juniper woodland</p> | <p>May be impacted. Suitable habitat (oak woodland) would be lost or altered as a result of this project. Direct impacts on the Mexican jay could occur as a result of the proposed project. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Empire Gulch and Cienega Creek where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species occurs throughout southeastern Arizona, southwestern New Mexico and Texas, and into Mexico.</p> |
| <p>Northern beardless-tyrannulet* (<i>Camptostoma imberbe</i>)</p> | <p>Desert and semidesert grassland</p> | <p>Upper riparian areas, such as upper floodplains with mesquite bosques and a variety of deciduous hardwood species</p> | <p>May be impacted. Suitable habitat would be lost or altered as a result of this project. Direct impacts on the northern beardless-tyrannulet could occur as a result of the proposed project because this species was documented in lower Barrel Canyon within the project area in the 1970s. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on northern beardless-tyrannulet populations located within the analysis area in Cienega Creek where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in lowland cottonwood-willow riparian woodlands, areas that would not be directly impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|--|---|---|
| Northern gray hawk* (<i>Buteo nitida maximus</i>) | Lowland riparian areas and mesquite bosques | Almost exclusively known from lowland riparian areas in perennial and intermittent drainages (cottonwood-willow) | May be impacted. Suitable habitat exists in that analysis area and could be altered. Direct impacts on the northern gray hawk are not anticipated as a result of the proposed project or the construction of the connected actions because there are no known occurrences of this species within these areas. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on northern gray hawk populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Indirect impacts could also result from prey species experiencing the same impacts as the hawk from proposed project activities, hence altering their predator-prey relationships. Population-level impacts are not expected because this species is typically observed in lowland riparian areas, which would not be directly impacted by this project. |
| Northern harrier* (<i>Circus cyaneus</i>) | Great Plains grasslands, cold temperate scrublands, semidesert grasslands, and agricultural fields | These hawks are commonly observed flying low over agricultural fields, wetlands, and other open country | May be impacted. Suitable habitat (semidesert grassland) exists in the analysis area and would be lost or altered. Direct impacts on the northern harrier are not anticipated as a result of the proposed project or the construction of the connected actions because there are no known occurrences of this species within these areas. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Indirect impacts could also result from prey species experiencing the same impacts from proposed project activities, hence altering their predator-prey relationships. Population-level impacts are not expected because the northern harrier is more likely to occur in more open grasslands outside the project area. |
| Painted bunting* (<i>Passerina ciris</i>) | Brushy tangles, hedgerows, briar patches, woodland edges, and swampy thickets | Dense brush often adjacent to thick, grassy areas or woodland edges; dense weedy habitats and understory of semi-open forest during migration and in winter | May be impacted. Suitable habitat (riparian areas surrounded by semidesert grassland) is present in the analysis area and could be altered. Direct impacts on the painted bunting are not anticipated as a result of the proposed project or the construction of the connected actions because there are no known occurrences of this species within these areas. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on painted bunting populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Population-level impacts are not expected because the painted bunting is more likely to occur in dense, brushy areas outside the project area. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| Painted redstart* (<i>Myioborus pictus</i>) | Ponderosa pine and pine-oak forests and mountain drainages | Most frequently observed in well-shaded, forested canyons and mountain slopes dominated by sycamores and evergreen oaks | May be impacted. The project area does not contain ponderosa pine woodland; however, it may contain pine-oak woodland, and there is hydriopterian vegetation in the analysis area that could be lost or altered. Direct impacts on the Lucy's warbler are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species prefers ponderosa pine and pine-oak forests, which would not be impacted directly by this project. |
| Phainopepla* (<i>Phainopepla nitens</i>) | Mostly found in desertscrub; but also mesquite bosque, riparian woodlands, pinyon-juniper, Madrean evergreen woodland, and semidesert grasslands | Closely associated with mistletoe, paloverde, mesquite, acacia, oak, and sycamore | May be impacted. Suitable habitat (mesquite, acacia, and oaks within Madrean evergreen woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the phainopepla could occur as a result of the proposed project. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on phainopepla populations located within the analysis area in Empire Gulch and Cienega Creek where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is typically observed in lowland desert washes and Sonoran desertscrub vegetation types, areas that would not be directly or minimally impacted by this project. |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Red-faced warbler* (<i>Cardellina rubrifrons</i>)</p> | <p>High-elevation riparian habitat</p> | <p>Prefer pine-oak forests and Engelmann spruce and Douglas-fir stands in steep, sloping canyons; less likely in aspen and oak thickets</p> | <p>May be impacted. Some suitable habitat (oak) exists in the project and analysis areas and patches of this habitat would be lost or altered. Direct impacts on the red-faced warbler are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species occurs throughout the southwestern United States into Mexico and prefers primarily pine-oak forests and Engelmann spruce and Douglas-fir stands, which would not be directly impacted by this project.</p> |
| <p>Rufous-winged sparrow* (<i>Aimophila carpalis</i>)</p> | <p>Desert and semidesert grassland</p> | <p>Flat to rolling hills with grasses and woody shrub cover at elevations below 4,000 feet amsl</p> | <p>May be impacted. The entire grassland area directly impacted by proposed action alternatives is above 4,400 feet amsl, and some would be lost or altered as a result of this project. Direct impacts on the rufous-winged sparrow are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because suitable habitat exists in greater quantities outside the project and analysis area (e.g., in the grasslands below Madera Canyon and on the Experimental Range).</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Scaled quail* (<i>Callipepla squamata</i>)</p> | <p>Semidesert grassland, Chihuahuan desertscrub, cold temperate desertscrub, and sometimes rural, developed areas</p> | <p>Favor dry, open grasslands and rolling hills interspersed with low-growing shrubs such as burroweed, snakeweed, cacti, and low, shrubby mesquite</p> | <p>May be impacted. Suitable habitat (semidesert grassland) exists in the analysis area and would be lost or altered. Direct impacts on the scaled quail are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Population-level impacts are not expected because scaled quail typically prefer more open areas than what occurs within the footprint of the proposed mine.</p> |
| <p>Scott's oriole* (<i>Icterus parisorum</i>)</p> | <p>Desert to piñon-pine and oak woodlands, chaparral, and grasslands</p> | <p>Breed in a wide array of habitats; generally found in open woodlands and arid scrub areas</p> | <p>May be impacted. Suitable habitat (Madrean woodland and semidesert grassland) exists in the project and analysis areas would be lost or altered. Direct impacts on the Scott's oriole are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this habitat generalist is widespread across Arizona.</p> |
| <p>Swainson's hawk* (<i>Buteo swainsoni</i>)</p> | <p>Semidesert grassland</p> | <p>Closely associated with grassland habitats, but has flexibility with the presence of shrubs; mostly nests in mesquite</p> | <p>May be impacted. Suitable habitat (grassland interspersed with shrubs and mesquite) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Swainson's hawk are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Population-level impacts are not expected because this species only appears to sporadically use the proposed project area.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
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| <p>Varied bunting* (<i>Passerina versicolor</i>)</p> | <p>Desert and semidesert grassland</p> | <p>Upland or in canyons, in dry washes, or edge of riparian areas; generally associated with low, thorny shrubs</p> | <p>May be impacted. Suitable habitat (low-thorny shrubs near riparian areas) exists in the analysis area and would be lost or altered. Direct impacts on the varied bunting could occur as a result of the proposed project. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on varied bunting populations located within the analysis area in Empire Gulch and Cienega Creek where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected.</p> |
| <p>Verdin* (<i>Auriparus flaviceps</i>)</p> | <p>Sonoran desertscrub, semidesert grassland, dry desert washes, and other lowland riparian areas</p> | <p>Favors Sonoran desertscrub areas containing an abundance of thorny shrubs and trees, including acacia, paloverde, mesquite, and ironwood</p> | <p>May be impacted. Suitable habitat (semidesert grasslands, riparian areas, and elements of Sonoran desertscrub) are present in the project and analysis areas and would be lost or altered. Direct impacts on the varied bunting could occur as a result of the proposed project. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across southern Arizona and prefers Sonoran desertscrub and dry desert washes, which would not be significantly impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|---|--|
| <p>Vermilion flycatcher* (<i>Pyrocephalus rubinus</i>)</p> | <p>Various riparian habitats, including those near rural residential areas, semidesert grassland, and Sonoran desertscrub</p> | <p>Typically found in broadleaf riparian woodlands and mesquite bosques in the vicinity of water</p> | <p>May be impacted. Suitable habitat (semidesert grasslands, riparian areas, and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the vermilion flycatcher could occur as a result of the proposed project. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on varied bunting populations located within the analysis area in Empire Gulch and Cienega Creek where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species is widespread across Arizona and prefers riparian areas, which would not be impacted significantly by this project.</p> |
| <p>Virginia's warbler (<i>Oreothlypis</i> [=<i>Vermivora</i>] <i>virginiae</i>)</p> | <p>A generalist of oak and juniper woodlands and sometimes conifer forests</p> | <p>Upland, riparian, brushy areas; typically observed in canyons, drainages, or steep mountain slopes with oaks</p> | <p>May be impacted. Suitable habitat (riparian areas and drainages within Madread evergreen woodland) exists in the project and analysis areas and would be lost or altered. Direct impacts on the Virginia's warbler are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species occurs in a wide variety of habitats across most of Arizona, and approximately two-thirds of all observations of this species are from higher-elevation conifer or pinyon-juniper woodlands.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|---|---|--|--|
| <p>Western burrowing owl* (<i>Athene cunicularia hypugaea</i>)</p> | <p>Sonoran desertscrub, open areas, and human-disturbed areas</p> | <p>Occur in flat, open, low-stature grasslands, sparsely vegetated desertscrub, and edges of human-disturbed lands</p> | <p>May be impacted. The mine footprint does not contain large blocks of open, sparse lands; however, the connected actions do. Direct impacts on the western burrowing owl are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Indirect impacts on the western burrowing owl could also result from prey species of the western burrowing owl experiencing the same impacts as the owl from proposed project activities, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not anticipated.</p> |
| <p>Western screech-owl* (<i>Megascops [=Otus] kennicottii</i>)</p> | <p>Sonoran desertscrub, various lowland riparian areas, pinyon-juniper woodlands, and Madrean evergreen woodlands</p> | <p>Found in nearly any woodland type, including Sonoran desert containing saguaros, ironwood, and paloverde up to Madrean evergreen and pinyon-juniper</p> | <p>May be impacted. Suitable habitat (semidesert grasslands, riparian areas, and elements of Sonoran desertscrub) exists in the project and analysis areas and would be lost or altered. Direct impacts on the western screech-owl are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Additional impacts could occur on populations located within the analysis area in Cienega Creek and Empire Gulch, where groundwater drawdown is modeled to occur as a result of all action alternatives. Prey species could experience the same impacts, hence altering their predator-prey relationships. Population-level impacts are not expected because this species is widespread across Arizona and prefers Sonoran desertscrub and dry desert washes, which would not be significantly impacted by this project.</p> |

| Species | Vegetation Community | Specific Habitat Features Used by this Species | Potential Habitat Impacts Resulting from All Action Alternatives |
|--|--|--|--|
| Whiskered screech-owl* (<i>Megascops [=Otus] trichopsis</i>) | Madrean oak woodlands; mountain drainages with sycamore, oaks, pines, juniper; and Madrean pine-oak woodlands | Forested canyons, slopes, and ridges; and dense stands of Madrean evergreen oaks with an abundance of medium-sized large trees and dense screening foliage | May be impacted. Small areas of suitable habitat (dense stands of Madrean evergreen oaks) exist in the project and analysis areas and would be lost or altered. Direct impacts on the whiskered screech-owl are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Indirect impacts could also result from prey species experiencing the same impacts from proposed project activities, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species tends to occupy higher-elevation areas of pine-oak and denser stands of Madrean evergreen woodland areas containing sycamore and cypress. |
| White-throated swift* (<i>Aeronautes saxatalis</i>) | No specific vegetation types; steep canyon walls, cliffs, pinnacles, and ridgelines with blank expanses of open rock | Found in any vegetation type containing cliffs with adequate nesting and roost sites present | Unknown impact. Cliffs providing nesting and roost sites occur adjacent to the analysis area, but these areas would not be impacted significantly by the proposed action. Because potential impacts to this species would be indirect (i.e., noise, vibration, artificial night lighting), population-level impacts are not expected. |
| Yellow-eyed junco* (<i>Junco phaeonotus</i>) | Madrean pine-oak and evergreen woodlands, mixed conifer, and deciduous riparian woodlands | Typically observed in coniferous forest types in southeastern Arizona, especially in areas that are cooler, wetter, and more shaded | May be impacted. Small areas of suitable habitat (dense stands of Madrean evergreen oaks) exist in the analysis area and may be removed or altered. Direct impacts on the yellow-eyed junco are not anticipated as a result of the proposed project because there are no known occurrences of this species within the project area, and no direct impacts resulting from connected actions are anticipated. Any individuals present in the project area could experience impacts from fugitive dust and air pollutants, and any individuals present in the analysis area could experience impacts from groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads. Indirect impacts could also result from prey species experiencing the same impacts from proposed project activities, hence altering their predator-prey relationships. Additionally, because the mine pit lake water quality could exceed wildlife standards for three contaminants that are known to bioaccumulate (i.e., cadmium, mercury, and selenium), impacts to this species could occur from eating aquatic invertebrates originating from the mine pit lake. Population-level impacts are not expected because this species tends to occupy higher-elevation areas of pine-oak and cooler, wetter, more shaded stands of Madrean evergreen woodland. |

Sources: PIF (2006); USFWS (1995).

* Species detected in the Rosemont area by Russell et al. (n.d. [1977]) or in the analysis area (eBird 2013).

Important Bird Areas

Arizona's Important Bird Area Program was established with the National Audubon Society in 2001 and is co-administered by Audubon Arizona and the Tucson Audubon Society (National Audubon Society 2010). Currently, there are 42 IBAs identified and/or recognized in Arizona, and the proposed action would occur within the Santa Rita Mountains, Coronado National Forest IBA (National Audubon Society 2013). The IBA designation coincides with the Coronado National Forest boundary around the Santa Rita Mountains. As part of the Sierra Madre avian community, which extends far south into central Mexico, the Santa Rita Mountains IBA contains a number of bird "Species of Conservation Status," according to the National Audubon Society (2010).

This IBA contains numerous species of concern recognized by the Forest Service (Federal Threatened or Endangered, Forest Service Sensitive, etc.). These species include some of those noted in tables 2 and 3 above: northern goshawk, northern gray hawk, Mexican spotted owl, whiskered screech-owl, Montezuma quail, elegant trogon, Arizona woodpecker, violet-crowned hummingbird, Lucifer hummingbird, Costa's hummingbird, buff-breasted flycatcher, varied bunting, golden eagle, American peregrine falcon, elf owl, northern beardless-tyrannulet, greater pewee, gray flycatcher, Bell's vireo, bridled titmouse, Virginia's warbler, MacGillivray's warbler, Lucy's warbler, black-throated gray warbler, Grace's warbler, red-faced warbler, Cassin's sparrow, Botteri's sparrow, and buff-collared nightjar. Many of these species (see table 2) are known to occur in the analysis area, or the analysis area contains suitable habitat for these species. Thus, these species are subsequently evaluated in greater detail within either the biological assessment (Forest Service and SWCA 2013; SWCA 2012a, 2012b), biologists' report (SWCA 2013a), or biological evaluation (SWCA 2013b), and/or in table 3 above.

According to Russell et al. (n.d. [1977]), there are 138 species of birds known to occur in the vicinity of the Rosemont area, and a total of 287 bird species has been observed in the Santa Rita Mountains Important Bird Area (eBird 2013b). Russell et al. (n.d. [1977]) also noted that since riparian communities make up such a small percentage of the total land area, yet are the richest in (bird) species, it can be expected that these riparian areas constitute the habitat most vulnerable to change; they state that impacts to these riparian communities should be mitigated.

Many of the species of concern that are known to occur in this IBA are not known to occur on lands that would be potentially impacted by the proposed project (see table 2). All action alternatives would result in direct, long-term or permanent impacts to grassland, woodland, desertscrub, and riparian vegetation, potentially resulting in nest destruction for some species of migratory and resident birds within the Santa Rita Mountains IBA. Habitat within portions of the IBA to be directly impacted by construction or operating activities (including the pit, buildings, roads, tailings or waste facilities, etc.) or in the paths of the electrical transmission line, water supply pipeline, or rerouted Arizona National Scenic Trail would be modified, altered, or lost to certain species of migratory birds. Nesting, overwintering, foraging, roosting, and molt migration habitat for migratory and resident birds within this important bird area also could be indirectly impacted by any of the action alternatives. Habitat within the important bird area could experience impacts from fugitive dust and air pollutants within the project area and could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on State Route (SR) 83 and other roads in the analysis area, causing a decrease in food availability for some migratory bird species and resulting in a loss of nest sites and cover. Although unintentional take of migratory birds is expected to occur, it would not contribute to a measurable decline in bird populations associated with the Santa Rita Mountains IBA.

Disclosure of Unintentional Take

EO 13186, which is partially tiered to the MBTA, requires Federal agencies (Section 3[9]) to “identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect of migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors.” “Unintentional take” is defined (Section 2[c]) as “take that results from, but is not the purpose of, the activity in question.” “Take” is defined (50 CFR 10.12) as to “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” In the case of the proposed action and action alternatives, take (manifested as wound or kill, especially for eggs and nestlings) is expected to occur but would be unintentional, as the purpose of the action is extraction of minerals, rather than taking of birds. The other part of this is determining whether the take is causing a measurable negative effect on migratory bird populations. Migratory birds are different from most other animals because they are highly mobile, and populations are (not without exception) fairly contiguous, with occurrences that are subject to shift, if needed. Because of this, migratory birds occupying the northern Santa Rita Mountains could fly off and become established elsewhere, or may occupy different destinations between years. Thus, for our purposes, populations are generally considered contiguous, occupying the full extent of the species’ range, unless there are well-established distributional gaps. This is consistent with the normal protocol dictated by the Southwestern Regional Office of the Forest Service for managing the impacts of projects on migratory birds. However, we will also consider the U.S. range in our evaluation, as the MBTA and EO 13186 are national direction. It is important to note that these laws refer only to take, not habitat loss or conversion.

All action alternatives would result in direct, long-term or permanent impacts to grassland, woodland, desertscrub, and riparian vegetation on Forest Service and private lands, potentially resulting in nest destruction for some species of migratory and resident birds. For all action alternatives, take (manifested as wound or kill, especially for eggs and nestlings) is expected to occur but would be unintentional, as the purpose of the action is extraction of minerals, rather than taking of birds. Migratory birds are different from most other animals because they are highly mobile, and populations are (not without exception) fairly contiguous, with occurrences that are subject to shift, if needed. Because of this, migratory birds occupying the northern Santa Rita Mountains could disperse and become established elsewhere. Thus, populations are generally considered contiguous, occupying the full extent of the species’ range, unless there are well-established distributional gaps.

The proposed project is expected to span 20 or more years, so land disturbance would be incremental, rather than affecting all 5,401 to 6,145 acres (depending on which action alternative is selected) in one breeding season. However, the acreage affected is not evenly distributed, as large areas would need to be prepped for mineral extraction, facilities development, etc. It is not reasonable for the purposes of mining to limit ground-disturbing activities to being only outside the breeding season (which spans a large block of time for the various species).

Activities resulting from all of the action alternatives that could result in unintentional take include the following:

- Removal of trees;
- Clearing of surface lands;
- Waste rock and tailings deposition;
- Pit lake and process ponds;
- Road construction and maintenance and associated increases in traffic volumes; and
- Facilities construction.

There should be little to no unintentional take of the less common, transient, or fringe-habitat species. This includes species such as cactus ferruginous pygmy-owl, northern beardless tyrannulet, and five-striped sparrow. It also includes species that do not nest in the project area but may forage there, such as golden eagle and American peregrine falcon. Some common species that are widespread in the project area and nest in situations that would be directly impacted by mining or land-clearing activities may include Gambel's quail, ash-throated flycatcher, and Bewick's wren. Of the relatively uncommon migratory bird species that are thought to use the area, most are found at higher elevations or near perennial streams (e.g., all of the rare hummingbirds, buff-breasted flycatcher, northern beardless tyrannulet, etc.) and thus are not expected to be directly impacted by the action alternatives. The analysis area only contains breeding habitat for three migratory bird species that have small breeding ranges within the United States: Botteri's sparrow, rufous-winged sparrow, and varied bunting. These three species have been documented in the proposed project area, but all are listed as rare to uncommon (Davis and Callahan n.d. [1977]).

According to EO 13186, species of concern should be considered first (see table 2). The references (see table footnotes) in table 2 also give insight regarding which, if any, species may be affected at the population level. Only those species with restricted ranges and that occur within habitats located in the footprint of the proposed mine could be considered to have "measurable" population-level effects. However, no measurable unintentional take for any species of migratory birds are expected because none of the species in table 2 have restricted ranges and occur in habitats within the footprint of the proposed mine. A number of largely Mexican species do breed in southeastern Arizona and nowhere else in the United States. However, of these, most are found at higher elevations or near perennial streams (e.g., all of the rare, breeding hummingbirds; buff-breasted flycatcher; northern beardless-tyrannulet; etc.); few are typical of the semidesert grasslands and lower Madrean oak woodlands or ephemeral drainages. Only Botteri's sparrow, rufous-winged sparrow, and varied bunting fall into the category of having restricted breeding ranges within the United States and occurring within habitats present in the proposed project area. All of these species have been documented in the Rosemont area, but all are listed as rare to uncommon (Russell et al. n.d. [1977]). For these three species, there could be unintentional take on individual birds, their nests, or eggs from mining activities (especially the land-clearing actions). More recent anecdotal information (i.e., within the past 10 years), however, indicates that these species may be more common in the analysis area (eBird 2013c, 2013d, 2013e, 2013f).

Because the Migratory Bird Treaty Act of 1918, as amended, provides Federal protection to all migratory birds, including nests and eggs, if an active nest is observed during any activities related to the project, measures should be taken to protect the nest from destruction and to avoid a violation of the MBTA. Under the MBTA, it is unlawful to take, kill, or possess migratory birds. Section 1 of the Interim Empty Nest Policy of the USFWS, Region 2, states that if the nest is completely inactive at the time of destruction or movement, a permit is not required in order to comply with the MBTA.

Overwintering Areas

The analysis area (as with nearly all of southeastern Arizona) provides important overwintering habitat for a variety of bird species, as does nearly all of southeastern Arizona. Grasslands, woodlands, and riparian areas (including Las Cienegas National Conservation Area) have among the highest biodiversity of wintering terrestrial species in the United States, along with southern California and southern Texas. Although much of the emphasis about effects of projects on migratory birds relates to breeding populations and habitat (typically in spring and summer), direction from the Southwestern Region of the Forest Service indicated that a migratory bird analysis should include disclosure of effects on important overwintering bird areas (non-breeding use during the winter). EO 13186 stated that an MOU between the Forest Service and the USFWS was necessary to establish conservation goals, mitigation measures, and accountability for ground-disturbing activities. The resulting MOU states the Forest Service shall

“consider approaches, to the extent practicable, for identifying and minimizing take that is incidental to otherwise lawful activities . . . giving due consideration to key wintering areas, migration routes, and stopovers” (Forest Service 2008:7).

The biotic communities of the proposed analysis area are predominantly semidesert grassland, Madrean evergreen woodland, and riparian (primarily xeroriparian or ephemeral wash) habitats, with some unvegetated rocky features (McLaughlin and Van Asdall n.d. [1977]; Russell et al. n.d. [1977]). These habitats, especially grasslands, are extremely important components of overwintering habitat in southeastern Arizona (Berlanga et al. 2010; Merola-Zwartjes 2004; Rich et al. 2004). Noteworthy groups of long-distance migratory overwintering birds include sparrows and raptors. The valleys and grasslands in southeastern Arizona are well known as winter diversity hotspots for these birds, and there are many birding tours that target semidesert grasslands of southeastern Arizona. In addition to the long-distance migratory species, there is also a high diversity of short-distance migrants and non-migratory (resident) birds of southeastern Arizona. Interestingly, many of the species that are residents in southeastern Arizona are considered migratory species under the definition of the MBTA and EO 13186 because they tend to be migratory in other parts of the United States. Thus, many of the resident birds in the analysis area are considered migrants for Federal regulatory purposes.

The PIF “North American Landbird Conservation Plan” (Rich et al. 2004) summarizes overwintering habitat and migration routes in North America and serves to highlight the importance of southeastern Arizona as a biodiversity hotspot and conservation center. For overwintering species, there are two general hotspots: southeastern Arizona and southern California. Southern New Mexico and Texas are also important for overwintering landbirds. These are important overwintering areas because they are located along the borderlands with Mexico and have mild winters. Rich et al. (2004) provide a series of tables (the pertinent information is summarized in the bullets below) that display relative scores related to winter bird conservation for southeastern Arizona, compared with the rest of the United States:²

- **Number of overwintering birds:** highest number of species in the United States, along with southern California;
- **Non-breeding winter distribution vulnerability:** high vulnerability, along with other southwestern borderland areas;
- **Threats to non-breeding winter birds:** high threat level, along with the rest of the southwestern United States;
- **Population trend vulnerability for non-breeding winter birds:** high vulnerability, along with much of the United States;
- **Combined winter vulnerability score:** highest vulnerability in the United States, along with southern California; and
- **Winter Watch List Species:** highest number of species in the United States, along with southern California.

Rich et al. (2004) divide the United States into several avian biomes (i.e., bird-centric physiographic provinces); the proposed analysis area falls in the Southwest Avifaunal Biome. In terms of breeding and wintering landbirds, southeastern Arizona ranks highest in species diversity. Rich et al. (2004:57) state that “grasslands support the highest number of Species of Continental Importance with declining trends in any southwestern habitat type.” They go on to say that riparian woodlands support the highest diversity of landbird species of all habitats in this avifaunal biome, noting that riparian habitats are not limited to

² The resolution of these tables is relatively low, so it does not differentiate the proposed project area from other areas of southeastern Arizona, but the proposed project area is probably typical of Madrean encinal and semidesert grassland species. Refer to Rich et al. (2004) for more details on the scores and their definitions.

perennial waters (Rich et al. 2004:58). Rich et al. (2004) list habitat fragmentation and conversion, as well as grassland degradation, as conservation issues for this biome.

A more recent PIF publication (Berlanga et al. 2010) reviewed the importance of various areas in the United States, Mexico, and Canada, as part of a tri-national vision for landbird conservation. The Mexican borderlands of Arizona, New Mexico, Texas, and California had the highest number of grassland-breeding species during winter. Also, southeastern Arizona and adjacent New Mexico had the highest diversity of arid land-breeding species, as well as the highest diversity during any season.

The findings of Rich et al. (2004) and Berlanga et al. (2010) are consistent with the work of other researchers with respect to biological diversity of breeding and overwintering migratory birds; the importance of semidesert grasslands, oak woodlands, and xeroriparian areas during winter; threats facing southwestern Arizona; and the importance of the area for conservation of migratory birds. For example, Block et al. (1992:65) state that “population numbers of many species of neotropical migratory birds are believed to be declining. Although the factors causing these population declines are unknown, habitat loss and fragmentation, both on breeding and wintering grounds, are assumed to be among the most important factors.” Merola-Zwartjes (2004:56) states that

[Southwestern United States] grassland birds are a source of great conservation concern, as this group of birds has shown consistently steep declines over the past few decades, on the order of 25-65 percent—more than any other guild of North American bird species. . . . Although some theorize that declines in populations of neotropical migratory birds are due to loss of wintering habitat in the tropics, most of the grassland birds in question are short-distance migrants that spend their winters in the grasslands of the Southwest [U.S.] and Mexico, suggesting that alteration of Southwestern grassland habitats may be contributing to the decreases witnessed.

Brown and Davis (1994) documented the extirpation and range reduction of 39 species of birds and mammals from southeastern Arizona. Although they go on to say that there was actually (at least at the time) an increase in number of species, even without the inclusion of invasive species, the grassland species (and large carnivores) constituted the largest groups of those extirpated or exhibiting reduced ranges.

At the more local level, in the vicinity of the proposed project, Russell et al. (n.d. [1977]) recorded 45 overwintering bird species on their four transects, conducted between January 26 and February 10, 1976, when migratory movements were expected to be lowest; this is therefore a conservative estimate of the number of species that may use the habitats outside this narrow window. Other species were opportunistically observed outside of the survey transects. Nevertheless, their results confirm a high diversity of overwintering species, including short-range migratory species, long-range migratory species, and resident species. Overwintering bird species that occur in the Rosemont area (Russell et al. n.d. [1977]) include (but are not limited to) at least 5 raptors (not including the golden eagle, observed in winter 2009 [see the “Bald and Golden Eagles” section in this document]), 4 woodpeckers, 3 corvids, 3 wrens, and at least 12 species of sparrows. The most-detected species during their winter transects included mourning dove (*Zenaida macroura*), Mexican jay, Bewick’s wren, ruby-crowned kinglet (*Regulus calendula*), house finch (*Carpodacus mexicanus*), canyon (or brown) towhee, rufous-crowned sparrow (*Aimophila ruficeps*), black-throated sparrow, Brewer’s sparrow (*Spizella breweri*), dark-eyed junco (*Junco hyemalis*), and huge numbers of chipping sparrows (*Spizella passerina*). Some of the short-distance migrants that wintered in the adjacent valleys but were present during breeding season in the Rosemont area include Cassin’s sparrow, lark sparrow, Botteri’s sparrow, northern cardinal (*Cardinalis cardinalis*), and pyrrhuloxia (*Cardinalis sinuatus*). Additionally, approximately 180 species of birds have been documented within the Santa Rita Mountains Important Bird Area during the months of December, January, and February from 1900 to 2013 (eBird 2013b).

The analysis area has important grassland, woodland, and riparian habitats that support populations of many species of overwintering birds and is thus a “key wintering area.” Southeastern Arizona is arguably the most biologically diverse wintering ground for short- and long-range migrants. These areas have also been identified as those that may be threatened by habitat fragmentation and degradation. All action alternatives would contribute to the decline in habitat quality and quantity for overwintering birds of southeastern Arizona. Additionally, since grass cover and grass-seed production are important in both habitat selection and overwinter survival of southwestern grassland birds (Bock and Bock 1998), any activity that would decrease these levels could be expected to have negative impacts on any migratory bird species that would winter in the area. Although birds can fly out of, or avoid, areas where the activities would take place, the holding capacity for most species of wintering birds (all except the more adaptable species) would be reduced.

Every alternative analyzed to this point in the NEPA process, except the no action alternative, would result in the removal of vegetation of all sizes and age classes and would change the rate of recruitment of trees, shrubs, and other vegetation. All action alternatives would result in direct impacts to overwintering habitat within the project area resulting from the construction and operating activities of the proposed project or construction of connected actions. Overwintering habitat for migratory birds within the analysis area could be indirectly impacted by any of the action alternatives. Overwintering habitat could experience impacts from fugitive dust and air pollutants within the project area and could experience impacts from decreased surface water flow in Barrel and Davidson Canyons, groundwater drawdown, noise, vibration, artificial night lighting, and increased traffic volumes on SR 83 and other roads in the analysis area, causing a decrease in food availability and cover for some migratory and resident bird species. Some impacts could extend beyond the mine footprint.

Bald and Golden Eagles

Bald and golden eagles are provided legal protection under the Bald and Golden Eagle Protection Act of 1940. Since that time, there have been numerous amendments. The bald eagle was recently delisted, and then the Sonoran population was essentially “relisted.” There is no need to address bald eagles for the proposed project because this species is not believed to occur within the biological analysis area (SWCA 2013a) because its habitat requirements do not occur in the area (large bodies of water are required for nesting and foraging). However, golden eagles are known to occur in the analysis area.

Russell et al. (n.d. [1977]) reported two observations of golden eagles in summer 1975, “over the highest ridges on the west portion of the [Rosemont] Area.” WestLand Resources Inc. (2007) reported golden eagles as having been observed in the analysis area. Golden eagles are commonly observed in the analysis area, including on December 10, 2009, when two individuals were seen soaring overhead from SR 83 Milepost 44 by numerous Coronado, SWCA, and WestLand Resources Inc. biologists. Two additional field trips were taken on April 6 and 7, 2010, by Coronado biologists, specifically to look for golden eagles during the period when they were expected to be nesting, but none were seen. The Coronado has received reports in the past of a young golden eagle that was electrocuted on Box Canyon Road; a golden eagle nest above Salero Ranch, on the south side of the Santa Rita Mountains, has also been reported to the Coronado. Further, there have been several anecdotal observations of this species in the analysis area within the past 15 years (eBird 2013a).

Although golden eagles occur in the analysis area, it is unknown whether they nest or simply forage in the analysis area. Distinguishing between foraging habitat and nesting habitat is important because there are relatively new regulations (Federal Register 74:46835–46879, September 2009) that allow for take

permits for golden (and bald) eagles. These guidance documents suggested that “take”³ permits could be issued at the project or programmatic level. For this proposed project, the appropriate take permit would be at the individual project level; however, the USFWS may not issue a take permit because of the lack of adequate population data (Good et al. 2005; Nielson et al. 2010) and may instead provide guidance stating there must be “no net loss of the breeding population.”

All action alternatives would be expected to alter or remove foraging habitat for golden eagles. Golden eagles have been observed in the analysis area but are not known to nest in the project area; therefore, impacts to breeding golden eagles are not anticipated. Although there would be noise and vibration resulting from implementation of the action alternatives, eagles would likely avoid the project area, thus not resulting in “take.” Any foraging eagles in the analysis area would likely shift their foraging activity to other nearby areas. New transmission lines and support structures would be constructed as a connected action to all action alternatives and are known to present collision and electrocution hazards for birds. In order to minimize potential impacts, however, Tucson Electric Power Company would incorporate current Avian Power Line Interaction Committee (2006) recommendations into the project design (Tucson Electric Power Company 2011).

³ “Take,” according to the Bald and Golden Eagle Protection Act, is defined as “pursue, shoot, shoot at, poison, wound, kill, trap, collect, destroy, molest, or disturb.”

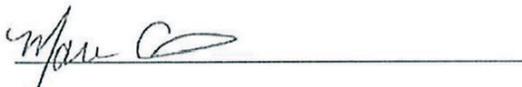
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