BLM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Draft
ENVIRONMENTAL ASSESSMENT

Copper Creek Exploration Project

DOI-BLM-AZ-G010-2023-0003-EA

February 2025

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1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the Copper Creek Exploration Project proposed by Redhawk Copper, Inc. (Redhawk).

1.1. BACKGROUND

The proposed Copper Creek Exploration Project is located approximately 9 miles east of Arizona State Route 77, the Town of Mammoth, and the San Pedro River in unincorporated Pinal County, Arizona, on public lands managed by the Bureau of Land Management (BLM), Gila District Office (GDO) Safford Field Office (SFO) in portions of Sections 03, 04, 10, 11, 14, and 15 of Township 08 South, Range 18 East, Gila and Salt River Meridian and Baseline (**Figure 1**).

The applicant, Redhawk, submitted a mining plan of operations application to BLM SFO to conduct mineral exploration activities, the *Copper Creek Exploration Drilling Program Plan of Operations, Pinal County, Arizona* (referred as the Proposed Action Alternative), dated May 20, 2022, to the BLM SFO. The proposed copper mineral exploration activities consist of 67 drill pad sites and associated access roads within unpatented claims on BLM-managed public lands. If approved, these activities would expand upon Redhawk's existing notice-level operations, of up to 4.06 acres of surface disturbance, including 9 drill pads and associated access roads. The Project Area is adjacent on all sides to undeveloped lands that include BLM-managed public lands, private parties including Redhawk's patented claims, and the Arizona State Land Department (ASLD).

The Project Area is within the historic Copper Creek Mining District (also referred to as the Bunker Hill Mining District), which has a history of mineral exploration and extraction dating back to the 1800s (Dolan and Lindley 2007, Hooper and King 2011).

1.2. PURPOSE AND NEED

The purpose of this action is to respond to Redhawk's request to explore, locate, and delineate copper deposits on public land mining claims. The need is the BLM's responsibility to respond to the plan of operations in accordance with mining law, Section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA), and the BLM Surface Management Regulations at 43 CFR 3809.

1.3. DECISION TO BE MADE

In accordance with the National Environmental Policy Act of 1969 (NEPA), the BLM will decide whether to approve, approve with modification, or deny the proposal for Redhawk's Copper Creek Exploration Project for exploratory drilling on their unpatented lode mining claims on public lands administered by the BLM.

1.4. CONFORMANCE WITH BLM LAND USE PLAN

The BLM manages public lands through Resource Management Plans (RMPs) and Land Use Plans (LUPs) as required by the FLPMA. The RMPs covering SFO outline management directions, including desired future conditions, suitable uses, monitoring requirements, goals, and objectives, as well as standards and guidelines. The *Copper Creek Exploration Drilling Program Plan of Operations, Pinal County, Arizona* has been reviewed to determine whether it conforms to the RMP and LUP terms and conditions as required by 43 CFR 1610.5 and is in conformance with the management decisions in the documents listed below.

- Safford District Resource Management Plan (BLM 1991b) and Partial Record of Decisions (BLM 1991b, 1994)
- Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (BLM 2004)
- Statewide Land Use Plan Amendment for Implementation of Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (BLM 1997).

1.5. RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

The Proposed Action Alternative, Preferred Action Alternative, and No Action Alternatives (described in **Section 2.0**) comply with applicable federal laws and regulations, and plans, programs, and policies of federal, state, and local governments, as well as affiliated Tribes, including:

- National Environmental Policy Act of 1969 (NEPA)
- Council on Environmental Quality regulations contained in 40 CFR 1500-1508
- BLM Primitive Road Design Handbook H-9115-1 (BLM 2012a)
- Occupational Safety and Health Administration (OSHA) standards
- Clean Water Act through the Arizona Department of Environmental Quality (ADEQ) Multi Sector General Permit (MSGP) for Mining Facilities
- BLM MS 6500: Wildlife and Fisheries Management (BLM 1988)
- Migratory Bird Treaty Act
- Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.)
- Bald and Golden Eagle Protection Act
- Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.)
- Clean Water Act of 1977

- Clean Air Act of 1963, as amended
- BLM MS 6720: Aquatic Resources Management (BLM 1991a)
- BLM MS 6780: Habitat Management Plans (BLM 1981)
- BLM Manual 6840: Special Status Species Management (BLM 2008)
- RMP for the Safford District (BLM 1991b) (now the SFO of the Gila District)
- Arizona Groundwater Code (Arizona Revised Statute Title 45-Chapter 2, Articles 4 and 5)
- Federal Noxious Weed Control Act (7 U.S.C. 2801 et seq.)
- National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665; 54 U.S.C. 300101 et seq.)
- Mining Law of 1872, as amended
- Redhawk Stormwater Pollution Protection Plan (SWPPP)
- Taylor Grazing Act of 1934
- Toxic Substance Control Act of 1976 as amended (TSCA) (15 U.S.C. 2601, et seq.).

1.6. IDENTIFICATION OF ISSUES

Four issues were identified by the BLM SFO Interdisciplinary (ID) team. The ID Team Checklist (**Appendix A**) provides the rationale for issues that were considered but not analyzed further (see 40 CFR 1501.9(f)(1)). The first three issues are directly related to wildlife resources and the fourth is directly related to water resources.

1. How would each alternative impact game and nongame species of wildlife (habitat degradation and loss, loss of surface water, noise pollution, light pollution, and introduction of invasive species or spread of existing invasive species)?
2. Across each alternative, what is the potential for impacts to occur to BLM sensitive species as well as threatened and endangered species within the Project Area (habitat degradation and loss, loss of surface water, noise pollution, and introduction of invasive species or spread of existing invasive species)?
3. The Project Area is within a wildlife connectivity area identified by the Arizona Game and Fish Department (AGFD); how would each alternative impact wildlife connectivity and movements?
4. What are the potential impacts to hydrologic and hydrologic-dependent resources associated with Copper Creek due to groundwater withdrawals as stated in each alternative?

2.0 DESCRIPTION OF ALTERNATIVES

2.1. NO ACTION ALTERNATIVE

Under the No Action Alternative, Redhawk would continue exploration activities on Bureau of Land Management (BLM)- administered public lands as outlined in the active Notice of mineral exploration operations (Notice; AZAZ106362501), but neither the Proposed Action Alternative nor the Preferred Action Alternative would be implemented. The additional exploration drilling activities and associated surface disturbances proposed under the submitted plan of operations for BLM-managed public lands would not occur. Exploration activities may continue on private lands and/or Arizona State Trust lands managed by the ASLD, as authorized by that agency. Activities that will be conducted under Redhawk's active Notice are summarized in **Table 2-1** and depicted on **Figure 2**.

The following activities would continue under the No Action Alternative:

- Redhawk would perform road maintenance and widening on 7,844 ft of existing roads using a dozer, excavator, backhoe, or similar equipment, expanding from 8 feet to 12 feet wide (**Table 2-1**). Road alignment would be cleared of vegetation to the minimum extent necessary using a chainsaw or hand saw.
- Redhawk would re-establish up to 3,242 ft, at 12 ft wide of roads for access to pad locations which includes blading the road for safety and removal or trimming of road-side vegetation if needed (**Table 2-1**).
- A total of nine drill pads will be cleared for drilling: 3 drill pads 60 ft x 60 ft, and 6 drill pads 70 ft x 70 ft, shown in **Table 2-2**.
- Each pad will have 1 sump for drill cutting containment, with dimensions 6 ft x 20 ft x 4 ft and will be sloped for egress. The sumps will be kept open only while a pad is actively being drilled.
- Cores will be drilled using a track-mounted core drill rig (DM100 drill rig or equivalent) with a secondary muffler to reduce noise impacts.
- Water for drilling would be pumped from two registered wells on private lands designated for industrial use, the Solar Well and Hendrickson Well.
- Once an exploration drill hole is completed, the drill hole would be abandoned in compliance with the ADWR abandonment requirements before moving to the next drill hole. Only one hole would be open at a given time.
- No fuel would be stored on site. Fuel for equipment at the drill pad site would be transported to site for each day and stored in the transfer tanks in the drillers' truck beds. A containment tray would be placed under the refueling site to catch any spills.

Table 2-1. Disturbance Authorized under Existing Notice

Activity	Count	Disturbance	Reclamation
70’ x 70’ Pads	6 pads	0.7 acres disturbance	0.7 acres
60’ x 60’ Pads	3 pads	0.3 acres disturbance	0.3 acres
Re-established, Previously Reclaimed Access Roads	3,242 linear ft, at 12-ft width	0.9 acres disturbance	0.9 acres
Currently Used Access Roads; Maintenance / Improvements, to be Left Open for Public Use	7,844 linear ft; widen existing 8 ft width by 4 ft to 12-ft total width	2.16 acres disturbance	—
Total		**4.06**	**1.90**

Table 2-2. Drill Pads under Existing Notice

Notice Drill Pad ID	Proposed/Preferred Action Drill Pad ID	Dimension (ft)	Easting	Northing
Pad A	BLM 46	70 x 70	549157	3623132
Pad B	BLM 12	70 x 70	549217	3623278
Pad C	BLM 16	60 x 60	549123	3623273
Pad D	BLM 17	70 x 70	549031	3623346
Pad E	BLM 07	60 x 60	549254	3623431
Pad F	—	70 x 70	549112	3623542
Pad G	BLM 15	60 x 60	548951	3623150
Pad H	—	70 x 70	548897	3623673
Pad I	—	70 x 70	549125	3623452

Notice-level operations will be completed by April 2026, including the following reclamation activities. All re-established access roads to pads, sumps and drill pad locations will be reclaimed. The topography of disturbed areas would be restored to similar conditions to those found prior to the Project activities. Reclamation would involve regrading areas disturbed during this project to the approximate contours as prior to Project activities or approximate contours of the landscape prior to any disturbance. The regraded areas would then be seeded using the reclamation seed mixture approved in coordination with the BLM.

The inclusion of this alternative helps identify baseline conditions and provides a contrast for the Proposed Action Alternative and Preferred Action Alternative.

2.2. PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative includes the proposed copper mineral exploration activities which consists of accessing and expanding 67 pre-existing drill pad sites and associated access roads for the purpose of exploratory drilling within BLM unpatented claims located in the Copper Creek (Bunker Hill) Mining District, Pinal County, Arizona. Under the Proposed Action Alternative, Redhawk would expand upon their existing Notice-level operations, consisting of 9 pads and associated access roads. All but three pads would continue into the Proposed Action Alternative and the Preferred Action Alternative. Pads F, H, and I would be fully reclaimed at

the end of the authorized Notice, as shown in **Tables 2-3 and 2-4** (See **Appendix B** for full list of pad IDs and coordinates). No work would continue with these three pads under the Proposed Action Alternative past the expiration of the Notice (AZAZ106362501; expires April 2026).

Table 2-3. Notice AZAZ106362501 Drill Pads Would Continue under the Proposed Action Alternative and Preferred Action Alternative

Drill Pad ID	Proposed Action Pad ID	Easting	Northing
Pad A	BLM 46	549157	3623132
Pad B	BLM 12	549217	3623278
Pad C	BLM 16	549123	3623273
Pad D	BLM 17	549031	3623346
Pad E	BLM 07	549254	3623431
Pad G	BLM 15	548951	3623150

Table 2-4. Notice AZAZ106362501 Drill Pads Would Not Continue under the Proposed Action Alternative and Preferred Action Alternative

Drill Pad ID	Proposed Action Pad ID	Easting	Northing
Pad F	—	549112	3623542
Pad H	—	548897	3623673
Pad I	—	549125	3623452

2.2.1. SURFACE DISTURBANCE

Redhawk proposes to incorporate the use of previously used pads and their associated access roads, many of which have evidence of current public use that is not associated with the Proposed Action Alternative. Those roads and pads were identified through review of satellite imagery, previous mineral exploration data, and ground-truthing. Approximately 8 ac of these previously used access roads have naturally reclaimed and would require reestablishment.

Total ground disturbance on BLM-managed lands is estimated to be 18 ac, which includes 6 ac for 67 drill pads (the previously disturbed and reclaimed portions of all pads plus any expansion to the dimensions specified in **Table 2-5**), 8 ac of re-established access roads (all previously disturbed for exploration activities and reclaimed); and 4 ac of road widening on existing access roads with minor maintenance (modifying the existing road prism[1] to allow safe passage of vehicles) and/or improvements (expanding the existing road prism to 12 feet [ft] wide to allow passage of equipment). Drill pad locations, re-established roads and currently used existing access roads that will be disturbed are shown on **Figure 3**. Approximately 35,254 linear ft of roads are identified as existing access roads with minor maintenance; these are currently 8 ft wide and could be expanded up to an additional 4 ft wide, to 12 ft total in width. These roads are

[1] The roadway prism is the area previously disturbed during road construction (ADOT 2018).

currently in use for public activities and may require improvements for safe vehicle passage, so any additional widening would continue to be open for public use (not reclaimed). Surface disturbance in riparian areas is included in these totals; Copper Creek is crossed at several locations by existing roads as described above and in **Table 2-1**. Pads accessed via Copper Creek Road would cross at a minimum of one and up to a maximum of four channel crossings each day. Pads accessed via Bunker Hill Road would not cross Copper Creek. The estimated total length of roads within riparian areas is 1,200 ft, and are withing existing, currently used access roads. Using the maximum vehicle width of 12 ft, a maximum daily use (i.e., vehicle driving on existing roads) of approximately 0.2 ac from proposed vehicles driving on existing roads through riparian areas is anticipated. Redhawk would drive on other existing roads on BLM lands, with no improvements needed. The drive-only roads are not included in the disturbance estimate.

Of the estimated 18 ac proposed for disturbance, the 14 ac of pads and re-established or improved access roads would be reclaimed pursuant to the reclamation plan (**Section 2.2.11**). The remaining 4 ac are widening disturbance outside the existing driving surface of roads that would remain open at 12 ft wide and would not be reclaimed following completion of work under the Proposed Action Alternative.

Table 2-5. Proposed Action Alternative and Preferred Action Alternative Surface Disturbance

Activity	Count	Disturbance	Reclamation
70’ x 70’ Pads	33 pads	4 ac	4 ac
60’ x 40’ Pads	34 pads	2 ac	2 ac
Re-established, Previously Reclaimed Access Roads	27,713 linear ft, at 12-ft width	8 ac	8 ac
Currently Used Access Roads; Maintenance / Improvements, to be Left Open for Public Use	35,254 linear ft, Widen existing 8 ft width by 4 ft, to 12-ft total width	4 ac	—
Total		**18 ac**	**14 ac**

Drill pads and access road alignments would be cleared of vegetation to the minimum extent necessary using a chainsaw or hand saw and levelled using a dozer, excavator, backhoe, or similar equipment. Topsoil is thin to non-existent in the proposed work areas. Where present, topsoil would be salvaged and stockpiled as part of the sidecast to form berms on the edge of the disturbance areas in advance of any construction, for use in reclamation at the conclusion of drilling activities, per BLM guidance H3809-1 Section 5.3.3.2.1 (BLM 2012b). If soil horizons are visible, they would be separated as such (BLM 2012b).

Access roads would need to have a 12-ft (single lane) travel width to accommodate track-mounted drill rigs. Twelve feet is the maximum width to which any roads for the Proposed Action Alternative may need to be expanded. No blasting would occur. Road maintenance (keeping existing roads open and safe for vehicle passage) and improvements (widening) would be conducted with minimum feasible impact and in compliance with the BLM Primitive Road Design Handbook H-9115-1 (BLM 2012a).

There are two categories of access roads (**Figure 3**) that may be expanded to 12 ft wide:

- **Currently Used Access Roads with Maintenance and Road Improvements, to be Left Open for Public Use**: These are actively used roads of adequate width to allow for safe passage of project equipment that connect to portions of the Project Area or are existing roads that are currently in use but may require minor maintenance or improvements to allow adequate access for drill rigs. Minor maintenance includes blading the existing road surface for safety but no new disturbance. Minor improvements, where necessary, include widening to 12 ft. Maintenance and improvements would include installation and maintenance of sediment and runoff control structures during all phases of the proposed project using best management practices (BMPs) such as fabric or excelsior filter fences or filter berms. Since these roads are currently in use, reclamation is not proposed for the currently existing road prism or where these roads are widened to 12 ft.
- **Re-established, Previously Reclaimed Access Roads**: These historically used, reclaimed roads are generally impassable by all but high-clearance, four-wheel drive vehicles and would need maintenance and widening in places to allow for drill rig access. These are minor roads that connect from the larger access roads to the drill pads. Proposed re-establishment activities include blading the road for safety and removal or trimming of road-side vegetation as needed for expansion to 12 ft wide to allow for drill rigs to pass safely.

2.2.2. DRILLING AND SUPPORT ACTIVITIES

The Proposed Action Alternative includes using up to 67 previously reclaimed drill pads accessed by historically used roads, some of which have been reclaimed or partially reclaimed. Excluding an estimated three months of down time annually for inclement weather, periods of unsafe conditions such as during the monsoons or lightning, and planned holiday breaks, Redhawk would conduct year-round exploration core drilling and geotechnical testing activities for 2 to 3 years, with one or two drill rigs operating at any one time within the Project Area.

Exploration drill sites that require earthwork would be located and prepared using standard construction practices for temporary mineral exploration to minimize surface disturbance and erosion as well as to facilitate reclamation. As depicted in **Table 2-5**, there are two dimensions for drill pads and drilling activities would differ slightly depending on the dimensions.

- **60 ft x 40 ft pads**: up to 34 pads would have these dimensions. Only a single hole orientation would be drilled from these pads, although it is possible that more than one hole would be drilled at that orientation, with no more than one hole open at a time. Minor maintenance and expansion may be required on these existing pads to allow for a level drilling surface and safe work environment.
- **70 ft x 70 ft pads**: up to 33 pads could have multiple hole orientations, requiring the larger pad. Only one hole would be open at a time. The need for additional holes on any of these pads would be determined based on results of core analysis after completion of the initial hole.

The 60 ft x 40 ft pads would have one hydrocyclone and lined sump situated within the footprint of each drill site to contain cuttings and manage drilling fluids. The 70 ft x 70 ft drill pads would accommodate drilling in multiple hole orientations, with only one active drill hole on a pad at any time. The same sump would be used for all holes on a pad. Drilling of multiple single orientation holes on single pads may occur consecutively, but determination of need for additional holes would depend on analysis of previous drilling and there could be 1 to 2 years between drilling additional holes.

Earthwork for site preparation would be performed with a backhoe, Cat® D8, or equivalent equipment. Seven existing monitoring wells on BLM-managed land would support the proposed groundwater monitoring (**Figure 4**).

Holes would be drilled using a core drill rig, and up to two drill rigs are proposed for concurrent use during the Proposed Action. Drill holes would be vertical or angled as determined appropriate for the data sought at the site. Hole depth is expected to range from 600 ft to 4,900 ft. A maximum of two holes could be open at any time.

Redhawk would follow standard drilling procedures and require a geologist to be available throughout drilling activities. The duties of the geologist would include supervising the drill rig, logging each hole according to the geologic features encountered, determining the maximum depth of each hole, recording depth to water if encountered, and advising the drill operator, as needed. The geologist would typically travel to and from the drill site in a separate pickup truck. Standard drilling fluids would be used in the drilling process, by drilling contractors licensed and receiving permits from the Arizona Department of Water Resources (ADWR) and following all state regulations. Existing disturbed lands would be utilized to the extent practicable to limit areas of new disturbance.

A drill operator would conduct the drilling. One or two helpers would normally remove and box the recovered core samples, mix drilling fluids in a portable mud tank, operate the water truck, assist with drilling operations, and conduct maintenance, as necessary. The crew would be transported to and from the drill site in up to three diesel and/or gasoline vehicles per drill rig. Only fuels required for approximately one day of drilling would be within the Project Area and would be contained in the service/fuel truck; all other fuels would be stored on private lands. Fuel for equipment at the drill pad site would be stored in the transfer tanks in the drillers' truck beds, then only in the fuel tanks for the rig, etc., when they are fueled up. A containment tray would be placed under the refueling site to catch any spills, and any soil contaminated with fuel would be collected with a shovel and disposed according to appropriate fuel disposal protocols. At the drilling site, fuel would always be in a tank ready for direct use or in a truck-contained transfer tank; small, portable gas cans would not be used. Any geotechnical drill borings would be completed with a small auger drill or core drill.

Redhawk would file the appropriate forms with the ADWR for drill holes, including the Notice of Intent (NOI) Form DWR 55-43B.

2.2.3. SCHEDULE

The preliminary Proposed Action Alternative schedule is to initiate the proposed activities as soon as feasible. Upon initiation of the Proposed Action Alternative, exploration activities are expected to be conducted at the Project Area 24 hours per day, 365 days per year, as weather permits, for 2 to 3 years. However, drilling would more realistically occur approximately 9 months per year, with breaks primarily during the monsoon season associated with weather conditions and the end-of-year holiday season.

2.2.4. PROVISIONAL PHASING MANAGEMENT PLAN

All remaining reclamation work, except revegetation and revegetation monitoring, would be completed no later than 6 months after the completion of activities under the Proposed Action Alternative or during the first appropriate reclamation season thereafter if the season is inappropriate for reclamation during the 6 months after activities completion. Completion of activities at each pad would be determined by analysis of core samples taken from the pad for adequate data, which would be within 6 months of collecting the sample from the pad. Redhawk would conduct reclamation of disturbed areas once it has been determined that the disturbed areas would no longer be required for the Proposed Action activities, i.e., core sample results are analyzed. This would be based on analysis of core sample data and the determination that further drilling at the pad is not necessary for data collection. No more than two pads would be actively used at any given time, but multiple pads would remain open to allow for the opportunity of additional exploration. These sites would be stabilized for an interim period while not in active use. Stabilization of these drill pads for dust management purposes includes stormwater BMPs to remain in place, as described in **Section 2.2.10**, and revegetation to allow for natural growth, described further in the Reclamation Plan (**Section 2.2.11**).

2.2.5. DRILLING EQUIPMENT AND PERSONNEL

Up to 12 personnel could be within the Project Area at any time during typical project activities. Each drill rig would typically include one Redhawk geologist and a contract drill operator with one or two helpers. Additional personnel within the Project Area at any time may include a drill supervisor, technician, safety coordinator for drilling activities, and a water truck operator. Exploration drilling and maintenance equipment typically could include:

- two 230 (or equivalent) track-mounted core drill rigs (smaller footprint than truck-mounted rigs)
- two portable light plants
- one service truck (fuel) for drill support
- one backhoe or excavator for general earthwork
- one Cat® D8 bulldozer with 12-ft blade for road and pad improvements
- one 3,500-gallon water truck
- up to ten 4WD pickup trucks and one UTV for personnel transport
- one portable auxiliary air compressor

- four generators
- two Solid Removal Units (SRU's)
- up to three booster pumps
- tele-handler (i.e., forklift)

Additional equipment could include small rotary drills for geotechnical testing, which would replace one of the core drill rigs while in use.

2.2.6. WATER MANAGEMENT PLAN

Daily water requirements would depend on the type of drill and whether one or two drills are active at any time. All drill rigs would be diamond core drill rigs. If the larger size is not required, then a smaller rig would be used and would require less water. Pumped groundwater would primarily be used for drilling activities, reintroduced to the subsurface through pumping into the drill holes to lubricate and cool the drill bit, and to wash out the loose material created during the drilling process. The drill rigs would run two 12-hour shifts daily except during periods of suspended drilling operations due to weather, planned holiday shutdowns, or other unpredictable reasons. In addition, as conditions warrant, water will also be required to control dust on the roads with use of a water truck. Therefore, daily requirements would differ. Water would be pumped via PVC hoses placed along the side of roads from an offsite, private well. Redhawk estimates approximately 70,000 gallons of water would be pumped per month per drill rig, including water use for dust abatement purposes. This water usage is estimated based on previous drilling efforts conducted with comparable equipment[2]. The water is expected to be pumped from registered wells on private lands designated for industrial use (**Figure 4**). One well is located at 32.73716, -110.46771, WGS 1984 (Solar Well). Two other wells (Hendrickson Wells) are situated approximately 350 ft apart. The original Hendrickson Well was established in 1925 at 32.74505, -110.50898, WGS 1984. The casing in the original Hendrickson Well is in questionable condition due to its age. The second Hendrickson Well was recently drilled and registered to provide a backup option in case the original well fails. The new well is located at 32.74506, -110.51015, WGS 1984. It is on the hillside west of the original well, outside the Copper Creek channel. Only one of the Hendrickson Wells would be used at any time. Similar amounts of water are expected to be pumped from the Solar Well and the combined Hendrickson Wells.

Drill fluids would be managed with a hydrocyclone and a lined sump will be used to contain drill cuttings at each drill site. BMPs (**Section 2.2.10**) for sediment control, as detailed in the Water Quality and Aquatic Resources section of the design features s and in the SWPPP for the Proposed Action Alternative, would be used during construction, operation, and reclamation to minimize erosion from disturbed areas. To facilitate drainage and prevent erosion, bladed roads would have water bars constructed, as needed, at BLM-recommended spacing. Sediment control

[2] Based on previous Redhawk drilling efforts, the total water use per rig per month is approximately 70,000 gallons and an average of approximately 1,500 meters (4,921 ft) was drilled monthly. Redhawk does not measure water use by length drilled but this equals 46.6 gallons of water per meter of drilling. The monthly meterage (and thus water use) can vary based on hole orientation and depth and the length of time it takes for drilling.

structures may include, but would not be limited to, fabric or excelsior filter fences, siltation, or filter berms.

Stormwater management is addressed under the federal Clean Water Act through the ADEQ MSGP for Mining Facilities and the required SWPPP. The SWPPP has been prepared to meet the applicable requirements for coverage.

2.2.7. ELECTRICAL POWER

All electrical power will be supplied by generators on the drill rigs or support vehicles. External lighting would be used during nighttime operations and be kept to the minimum required for safety purposes. All lighting fixtures would be hooded and shielded. Lights would be directed down toward the interior of the drilling operations to minimize light pollution onto any adjacent lands as viewed from a distance, except for safety in unforeseeable circumstances such as a medical emergency.

2.2.8. SURFACE OCCUPANCY

Activities covered under 43 CFR 3710 Subpart 3715.2, may include the use of portable toilet facilities. An appropriate quantity of portable toilets would be made available for Redhawk employees and contractors working in the Project Area. All equipment, materials, and supporting items such as portable toilets and water storage tanks would be removed after it has been determined that they are no longer needed.

2.2.9. TRANSPORTATION PLAN

All project-related traffic would observe a 10-mph speed limit to enhance public safety, protect wildlife and livestock, and reduce fugitive dust emissions. Maintenance of access roads would only be conducted as necessary and in coordination with the BLM, ASLD, and/or Pinal County, as appropriate.

Transport of personnel and equipment within the Project Area would be by unpaved roads. Incoming materials would include fuel, lubricants, drill supplies, and various vehicle and equipment maintenance items. Water trucks would be used for dust abatement, as needed. Water for drill purposes would be piped to pads from offsite.

2.2.10. DESIGN FEATURES AND BEST MANAGEMENT PRACTICES

To mitigate probable effects on the environment, Redhawk would implement several design features and BMPs.

Fire Prevention Plan

All applicable state and federal fire laws and regulations would be complied with, and all reasonable measures would be taken to prevent and suppress fires in the Project Area. In the

event the Proposed Action Alternative activities start or cause a wildland fire, Redhawk would be responsible for all costs associated with the suppression. All fires must be reported to the jurisdictional fire agency regardless of size and actions taken.

The following fire precautionary measures would be taken to prevent wildfires:

- Fire watch personnel would be assigned for earthmoving activities during dry or windy periods. All vehicles associated with the drilling program would carry fire extinguishers and a minimum of 5 gallons of water.
- Project vehicles would avoid driving or parking on dry vegetation.
- Fire-fighting equipment (e.g., shovel, Pulaski, extinguishers) would be kept at each drill and construction site.
- Fuel service trucks would contain one 35-pound-capacity fire extinguisher charged with the necessary chemicals to control electrical and fuel fires.
- Welding or other construction work is not anticipated during this program. If, however, this becomes necessary, those sites would have personnel dedicated to fire watch duties during the activities; there would be at least two long-handled round-point shovels and two 5-pound ABC dry chemical fire extinguishers available within the Project Area.
- No smoking would be allowed while operating equipment or while walking or working in areas with vegetation.
- All equipment assigned to the Proposed Action Alternative would be inspected and approved by Redhawk operators. Internal combustion engines (stationary or mobile) would be equipped with spark arresters that meet BLM standards.
- If a fire starts in the Project Area and can be managed, Redhawk would initiate and safely implement fire suppression activities (e.g., using a fire extinguisher or fire water packs with pumps, using a shovel to throw dirt on the fire or remove small patches of vegetation). Fire suppression personnel and equipment, including water trucks, would be dispatched immediately, no longer than 15 minutes from the time a fire is reported.
- If the fire is unmanageable, field crews would first evacuate and then make appropriate notifications.
- If the BLM enters fire restrictions in the Project Area, the applicant must coordinate with BLM to comply with fire restriction conditions.

Notifications would include the following agencies:

- Emergency response at **911**, and
- The BLM SFO at **928-348-4400**

Information reported would include the location (latitude and longitude if possible), fuels involved, time started, who or what is near the fire, and the direction of fire spread. All accommodation would be made to allow immediate safe entry of firefighting apparatus and personnel.

Biological Resources

Migratory Birds

The following design features would be implemented to minimize impacts to migratory birds:

- Vegetation clearing activities, if necessary, would be performed outside of the February 1 through September 30 breeding/fledgling season for migratory birds. Should vegetation clearing be performed during the breeding/fledgling season, prior to clearing, BLM would be consulted, and a qualified biologist would perform a nest survey with a 50-foot radius from the vegetation clearing areas. Pre-disturbance surveys for migratory birds will be conducted no more than 14 days prior to initiation of site disturbance. If the disturbance to the specific location does not occur within 14 days of the survey, another survey would be completed.
- If active nests are located, a protective buffer (the size depending on the habitat requirements of the species) would be delineated after consultation with the BLM resource specialist and Proposed Action Alternative activity would be delayed within the buffer area until fledging is confirmed.

Other Wildlife

Measures for protection of other wildlife would include:

- Construction of all sumps and other small excavations would have a sloped end for egress and would be backfilled or covered after completion of drilling activities, to preclude access.
- No vegetation clearing, drilling or reclamation would occur within a 500-ft buffer of the centerline of Copper Creek riparian areas (**Figure 5**) during the yellow-billed cuckoo (*Coccyzus americanus*) breeding season, from May 25 to September 30.
- A secondary muffler would be installed on drill rigs to reduce noise impacts. Surveys would be completed by US Fish & Wildlife (USFWS)-trained, 10(a) 1(A) permitted, and experienced persons familiar with yellow-billed cuckoo vocalizations. A full season of surveys consists of a minimum of four survey visits within three specified survey periods, between June 15 and August 15, to ensure 95 percent probability of detecting cuckoos in the area during the breeding season (Halterman et al. 2016, USFWS and U.S. Bureau of Reclamation 2019). Data would be shared with BLM in addition to reporting to USFWS.
- Harassment of livestock or wildlife would be prohibited.
- A worker environmental awareness program (WEAP) would be developed by a trained biologist. The WEAP would provide information regarding species that may be encountered during project activities, with specific information about the Sonoran desert tortoise (*Gopherus morafkai*), yellow-billed cuckoo, and aquatic species present in Copper Creek. The WEAP would be presented to Redhawk by a trained biologist prior to project initiation and this training would be required for all onsite workers prior to entering the site.
- All vehicle operators would always inspect the work area and beneath all vehicles and equipment prior to starting and moving equipment to ensure there are no wildlife species in harm's way.

- A 10-mph speed limit for the project would aid in avoiding wildlife collisions.
- Effects to wildlife at night would be minimized by directing lights down toward the interior of the drill pads. All proposed lighting would be located to minimize light pollution onto any adjacent lands as viewed from a distance. All lighting fixtures would be hooded and shielded, face downward and directed on to the pertinent site only.
- Drill pads and access roads are already existing; any new disturbance associated with expansion of drill pads and access roads would be adjusted to avoid impacts to sensitive biological resources as necessary and in consultation with the BLM resource specialist.

Vegetation and Soils

The following design features would be implemented to minimize soil disturbance and impacts to vegetation:

- Native vegetation would be left in place wherever possible.
- Vegetation removal and soil disturbances, including for temporary road improvements such as filling potholes, trimming shrubs along roadways for safe travel, repairing damaged existing drainage features, and removing large boulders that may pose a travel hazard, would be minimized to the extent practicable.
- Revegetation techniques and reclamation practices (**Section 2.2.11**) would include revegetating disturbed areas as similarly to surrounding, undisturbed areas as possible. Seed beds would be prepared by roughening the soil surface. Seedings and/or plantings would occur as soon as practicable after seedbed preparation. Seeding should take place to utilize fall or winter rains, or prior to monsoonal rains if approved by the BLM. Native seed mix, application rate, and seeding methods would be specified by the BLM. Redhawk would conduct baseline and post-reclamation line-point intercept transects as described in the Reclamation Plan (**Section 2.2.11**) and coordinate with BLM and report reclamation activities and findings annually.
- Pulling up the sidecast during reclamation recontouring is expected to be sufficient to replace the soil profile and support revegetation. Culvert installation is not anticipated, but water bars designed per the BLM Primitive Road Design Handbook (BLM 2012a) may be added where appropriate. Road surfacing materials such as gravel are not anticipated. Redhawk would notify BLM if road surfacing is determined to be necessary.
- Following completion of earthwork, all disturbed areas would be broadcast seeded. Seeds may be covered with erosion control blankets to aid in their establishment.

Noxious Weeds

Redhawk would implement noxious weed monitoring and control measures in accordance with BLM Handbook H-3809-1 (BLM 2012b) and H-1740-2 during construction and continuing through operations and reclamation. The spread of noxious weeds would be controlled by managing the following potential sources:

- To avoid the spread of noxious weeds, equipment would be cleaned to ensure that all plant materials and soil is removed before being brought to the site. The main areas on vehicles that would be decontaminated would include, but are not limited to, the

equipment tracks, tires, undercarriage, axles, wheel wells, running boards, bumpers, and brush guard assemblies.

- Vehicles would be confined to existing roadways and not permitted to conduct overland travel to reduce the potential for new weed establishment.
- Seed mixes, wattles, and other materials used for erosion control and soil stabilization would be certified weed-free or Excelsior matting.

Cultural Resources

The Project Area has been previously subject to intensive Class III pedestrian survey efforts and the entire Project has been surveyed for cultural resources (Dolan and Lindley 2007, Hooper and King 2011). The previous Class III identification efforts, while over 10 years old, adhere to current Arizona State Historic Preservation Office (SHPO) guidance (SHPO 2004). All three previous projects used currently accepted ASM and BLM survey and site definition methods, and the principal investigators all meet Secretary of the Interior Standards. Of particular importance in considering potential buried archaeological sites and the need for further survey, the nature of the rocky substratum in the Bunker Hill district and the greater Galiuro Mountains is not conducive to widespread deposition and the burial of cultural deposits is not considered likely. Furthermore, the prior survey projects in the current Project Area conducted intensive historical research on the Bunker Hill mining district, including historical map research to identify properties that met the 50-year age threshold for consideration for inclusion on the National Register of Historic Places (NRHP) during the 2007, 2008, and 2011 survey efforts. Additional map research conducted in 2024 for this EA indicated that there are no additional properties in the Project Area dating to the late 1960s or early 1970s that might be considered 50 years old, and potentially be historic properties.

The previous identification efforts indicate that five archaeological sites that are eligible for the NRHP—four historical mining and mining-related sites and one prehistoric limited activity site—are located near the Project Area. The sites include: AZ BB:3:47(ASM) – The Copper Creek Railroad, a historic period narrow gauge railroad; AZ BB:3:34(ASM) – The Copper Prince Mine, a historic period mineral extraction locale; AZ BB:7:22(ASM), a historic period mining camp and mineral extraction locale, AZ BB:7:23(ASM) – Copper Creek Site, a historic period townsite and mineral extraction locale; and AZ BB:2:195(ASM), a multicomponent site consisting of a prehistoric rock shelter with associated artifacts and a historic period mineral extraction locale. The Project would avoid completely four of the historic properties with the fifth (AZ BB:7:23(ASM) having only one drilling location placed in a highly disturbed area, away from any recognizable cultural elements. Following National Park Service guidance on the significance of historical mining properties (Noble and Spude 1997), the project has been designed to avoid elements of the Historic-period mining sites that contribute to their significance under Criterion D. Indeed, for the four historic-period sites, the expansive nature of hard-rock mining sites resulted in no effects to any significant historical feature. For the prehistoric site eligible for the NRHP, the site is completely avoided by Project activities. In summary, the Proposed Action would have no adverse effect on any historic properties. The Proposed Action Alternative would avoid adverse effects to both unevaluated and evaluated prehistoric or historic sites potentially eligible for listing in the NRHP.

- In the event a site is discovered and not avoidable, the necessity of drilling at the site would be evaluated. If it is determined drilling at the site is necessary, Redhawk would work with BLM in accordance with applicable preservation office agreements (e.g., Arizona State Historic Preservation Office [SHPO]) to undertake mitigation (e.g., data recovery). If a site meets NRHP eligibility criteria, a historic properties treatment plan, data recovery plan, and/or other appropriate mitigation would be completed under applicable agency agreements or memoranda of agreement with BLM. If a site does not meet eligibility criteria as defined by the NRHP Criteria for Evaluation, no further cultural work would be performed.
- Any cultural and/or paleontological resource discovered by Redhawk, or any person working on the behalf of Redhawk, on BLM-managed lands would be immediately reported to BLM authorized representative. Such resources include any historic or prehistoric site, structure, object, artifact, human remains, or vertebrate fossils.
- Redhawk would suspend all operations in the immediate area of any cultural and/or paleontological resource discovered until written authorization to proceed is issued by the authorized representative. BLM would determine the appropriate course of action to prevent the loss of significant cultural or scientific values. In the event of the unanticipated discovery of significant cultural remains, where adverse impacts to the resource cannot be avoided, Redhawk would be financially liable for all resulting costs that may include preparation of a Historic Properties Treatment Plan (HPTP), data recovery excavations and reporting, and cultural material curation. Failure to notify BLM about a discovery may result in civil or criminal penalties in accordance with the Archaeological Resources Protection Act of 1979 (as amended).
- Drill pads and access roads are already existing; any new disturbance associated with expansion of drill pads and access roads would be adjusted to avoid impacts to sensitive cultural resource sites, as necessary and in consultation with the BLM resource specialist.
- Redhawk would be responsible for assuring that all project personnel and contractors have been instructed on cultural resource avoidance and protection measures.

Public Safety and Access

- All equipment and other facilities would be maintained in a safe and orderly manner. When drills are moved, personnel would be in place to ensure the public who are using the roads are aware of activity.
- Drill pads and 8 ac of their associated access roads (**Figure 3**) would be reclaimed after the completion of sampling and logging and upon determination that the disturbance is no longer needed for exploration activities. Sumps would be backfilled when the previously stated criteria are met and there is no standing water present in the excavation.
- Active exploration roads (spur roads off the main roads) would be closed for use by others. After completion of exploration work at a drill pad, 4 ac of publicly used access roads would be left open for public use, and 8 ac of roads would be reclaimed as discussed in **Section 2.2.11**.

- All construction sites and access roads would be clearly marked or flagged at the outer limits prior to the onset of any ground disturbing activity. All personnel would be informed that their activities must be confined within the marked or flagged areas.
- As part of reclamation, Redhawk would be responsible for ensuring that boreholes drilled as part of this Proposed Action Alternative are abandoned in accordance with ADWR regulations and that all excavations or other openings in the ground are backfilled and properly covered, according to the Arizona regulations.
- If any existing roads are degraded because of Redhawk activities, Redhawk would return them as close as possible to an appropriate road function and width.
- In the case that the water-related ranching infrastructure is damaged by Redhawk or associated contractors, Redhawk would alert the appropriate rancher, and the infrastructure would be repaired by Redhawk as soon as possible.
- All Proposed Action Alternative-related traffic would observe a 10-mph speed limit to enhance public safety.

Water Quality

The following measures would be implemented by Redhawk to prevent water quality and aquatic resource degradation:

- All drill sites would be maintained in accordance with Occupational Safety and Health Administration (OSHA) standards.
- Stormwater BMPs per the Redhawk SWPPP would be used at exploration sites to minimize stormwater erosion.
  - Loose and spillable materials would be covered, kept in appropriate containers or within containment to minimize discharges of stormwater associated with the project.
  - Spills and leaks would be cleaned up quickly with dry materials.
  - Vehicles and equipment would be inspected for leaks and dry absorbent, or drip pans would be used to ensure leaks are contained.
  - Spill kits would be kept in the Project Area, labeled, and in an easy location to access.
- Drill cuttings would be contained within the Project Area, and fluids would be managed using a catch basin when transferring liquids, stored appropriately and spills would be cleaned up. Sediment traps would be used as necessary and filled at the end of the drill program.
- Cut and fill slopes would be constructed at the maximum practicable slope ratio to minimize erosion and surface disturbance area.
- Excelsior wattles or bales, silt fences and other sediment control features would be installed as necessary on, around, upslope, and/or downslope of drill sites and access roads to control sediment erosion. Sediment controls would be inspected as required by the MSGP SWPPP and following heavy precipitation events.
- The road improvements would adhere to the design standards and BMPs outlined in the H-9115-1 Primitive Road Design Handbook (BLM 2012a).

Air Quality/Dust Control

The following design features would be implemented to control dust and minimize impacts to air quality:

- Redhawk would not proceed with any construction or exploration activities without taking reasonable precautions (e.g., general tidiness, equipment inspection and maintenance) and would keep pads and roads clear of debris to minimize airborne particulate matter.
- All Proposed Action Alternative personnel would be educated on the dust control requirements in the air activity permit.
- All Proposed Action Alternative-related traffic would observe a 10-mph speed limit to reduce fugitive dust emissions.
- As conditions warrant, water may be utilized to control dust on the roads.

Erosion Control

The following design features would be implemented to control erosion:

- Earthwork design and road improvements would adhere to the design standards and BMPs outlined in the H-9115-1 Primitive Road Design Handbook (BLM 2012a).
- When steep cut slopes or embankments are constructed, methods to control erosion would be employed.
- Reclamation would be implemented at the earliest time feasible, as defined in the Reclamation Plan (**Section 2.2.11**), to prevent undue degradation of soils.
- Limiting the length of continuous berms to prevent water channeling on road surface during road widening, using breaches in berms to turn water off the roads, and slightly out-sloping roads to limit runoff concentration.

Hazardous and Solid Waste Management

The following design features would be implemented to manage hazardous and solid waste:

- Redhawk would dispose of waste (e.g., trash produced by the workers such as food wrappers, and scraps) daily. Trash would be stored in Redhawk trucks and removed when the workers leave the Project Area.
- Pursuant to 43 CFR 8365.1-1(b)(3) and 43 CFR 3809.420(b)(5) and (6), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle.
- Hazardous materials would not be drained onto the ground or into drainage areas.
- All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, would be removed to a disposal facility authorized to accept such materials.
- Petroleum products, including greases, oils, etc., would be used in the maintenance of equipment and would be stored on drill support vehicles or on the drill rig. Hydrocarbons (outside of daily/short-period quantity) usage would be stored on private land.
- No solid waste would be permitted in sumps.

- If a spill of a petroleum product is considered to meet a reportable quantity per ADEQ guidelines (a spill of any quantity that impacts a waterway within Arizona), measures would be taken to control the spill. The ADEQ Emergency Response Unit would be notified, the BLM would be notified within 24 hours, and the appropriate remedial actions and confirmation sampling would be conducted under the direction of ADEQ.

2.2.11. RECLAMATION PLAN

Redhawk would conduct reclamation of disturbed areas once Redhawk determines through core sample analysis that no further drilling will occur at a pad. Completion of activities at each pad would be determined by analysis of core samples taken from the pad for adequate data. Proposed Action Alternative activities would occur over approximately 2 to 3 years. All reclamation work remaining at that time, except revegetation and revegetation monitoring, would be completed no later than 6 months after the completion of activities under the Proposed Action Alternative. Revegetation would be completed at the earliest feasible time within the first growing season after the completion of activities under the Proposed Action Alternative and revegetation monitoring would continue until considered complete by the BLM. No more than two pads, each with one open exploration hole, would be actively used for drilling at any given time, but pads could remain open to allow for the opportunity of additional exploration. These sites would be stabilized for an interim period while not in active use. Stabilization of the drill pads for sediment control will include BMPs outlined in the SWPPP and revegetation pursuant to the reclamation plan described below.

Reclamation would be completed to the standards described in 43 CFR 3809.420(b)(3). Reclamation would meet the reclamation objectives as outlined in the U.S. Department of Interior Solid Minerals Reclamation Handbook #H-3042-1 (BLM 1992) and Surface Management Handbook H-3809-1 (BLM 2012b). All Redhawk drill sites and sumps would be recontoured and reseeded, with potential supplemental plantings and seedings, as would any drill site access roads that are determined to require reclamation through coordination with BLM.

Redhawk would conduct line-point intercept transects on 10 percent of the proposed pads prior to project disturbance of the pads, to provide a measure of baseline cover. Redhawk would also conduct a line-point intercept transect on a reference pad; a pad previously disturbed that will not be used by Redhawk for the project. Details of line-point intercept data collection would be determined in coordination with the BLM. Post-reclamation line-point intercept transects would be conducted annually during reclamation in the same locations at the same time of year as the baseline survey was conducted. Line-point intercept surveys would continue until 70 percent of baseline cover was met. Annual reports outlining reclamation progress would be submitted to the BLM with recontouring, reseeding, and planting dates by area and line-point intercept data. Redhawk would further collect photos of all pads prior to project disturbance, using standard operating procedures for photo collection provided by the BLM. These photos would be used as a supplement to the line-point intercept data and to further provide a visual aid.

Reclamation is intended to return disturbed land to a level of productivity comparable to the level of productivity of any specific area as it was prior to activities associated with the Proposed Action Alternative. Land uses in the Project Area includes wildlife habitat, livestock grazing, hunting, and dispersed recreation. Land use is not expected to differ following activities associated with the Proposed Action Alternative.

If there were any extended periods of inactivity during the Proposed Action Alternative schedule (**Section 2.2.3**), interim reclamation would occur including filling sumps, cleaning sites, and maintaining the overall safety of the Project Area. Surface disturbance would be reclaimed after completion of sampling and logging and upon determination that the disturbance is no longer needed for Proposed Action Alternative-related activities. Sumps would be backfilled once the previously stated criteria are met and there is no standing water present in the excavation. Petroleum products used for equipment maintenance would be removed with the equipment. The BLM and ADEQ would be notified prior to any periods of inactivity greater than 120 days in the Project Area.

After the Proposed Action Alternative activities are completed, reclamation would involve regrading disturbed areas related to this Proposed Action Alternative to the approximate contours as prior to Proposed Action Alternative activities or approximate contours of the landscape prior to any disturbance. The regraded areas would then be seeded using the approved reclamation seed mixture and application rates furnished by the BLM. A BLM specialist (e.g., botanist, range management specialist, or soil scientist designated by BLM) would provide the list of approved type and quantity of seed mixtures, seeding method, and seeding locations.

Portions of the Project Area have been previously disturbed for mineral exploration purposes similar to those described in the Proposed Action Alternative. Due to this, following Proposed Action Alternative reclamation, the topography of disturbed areas, including roads and pads, would be restored to similar conditions to those found prior to the Proposed Action Alternative activities approximate contours of the landscape prior to any disturbance as previously mentioned.

Drill Hole Plugging

Once an exploration drill hole is completed, the drill hole would be abandoned in compliance with the ADWR abandonment requirements. Geotechnical auger holes would be backfilled with drill cuttings and surface material.

Regrading and Reshaping

Regrading and reshaping of all constructed drill sites, including sumps and pad access roads, would be completed to approximate the contours as prior to Proposed Action Alternative activities or to approximate the surrounding topography. Fill material would be pulled onto the roadbeds as necessary to fill the road cuts and reclaim the slope to conditions as they were prior to activities associated with the Proposed Action Alternative. Roads and drill sites would be regraded and reshaped with an excavator. Erosion control would be implemented in accordance with the BMPs outlined for the Proposed Action Alternative.

Topsoil Handling

Soils are generally thin to non-existent on the previously disturbed pads of the Proposed Action Alternative and the depth of cut for exploration road improvements would be minimal. During reclamation activities at the Project Area, potential growth media stored in the form of berms and push piles, created during construction activities, would be distributed over surface disturbance areas. Growth medium would be replaced without mixing with subsoil to the extent practicable. Addition of organic material to improve soil condition may be necessary at some sites.

Revegetation

Generally, seedbed preparation and planting would take place in the fall following the regrading of disturbed areas to utilize fall or winter rains, or prior to monsoonal rains if approved by the BLM. All reclaimed areas would be broadcast seeded with a cyclone-type bucket spreader or a mechanical blower. Plantings may be added as appropriate if vegetation is removed, in coordination with BLM specialists. Broadcast seed would be covered by harrowing, raking, or other site-specific appropriate methods, as necessary, to provide seed cover and enhance germination. Erosion control blankets may be used to further aid in seed survival. Reclaimed surfaces would be left in a textured condition (i.e., small humps, pits, etc.) to enhance moisture retention and revegetation success while minimizing erosion potential.

The seed and plant list, to be provided by the BLM, would be based on known soil and vegetative conditions, and selected to establish a plant community similar to the undisturbed, native plant community specific to the Project Area. Broadcast seeding would be at an appropriate per-acre rate to be consistent with the surrounding vicinity. The seed mixture would be certified pure live seed (PLS) and weed-free.

Revegetation activities (seeding) may be limited by the time of year during which they could be effectively implemented. Seeding would be completed at the appropriate time in coordination with BLM, which is expected to be in the fall or winter, unless the BLM approves pre-monsoon seeding. Because post-mining monitoring is required of the operator until reclamation is complete, monitoring would be conducted by Redhawk after the growing season following regrading, reseeding, and plantings, until the site is deemed stable by the BLM. Additional reclamation activities include the removal of all equipment, supplies, and materials brought onto public land at the end of the Proposed Action Alternative.

Timing of revegetation activities is important to the overall success of the program. To the extent practicable, seeding activities would be timed to take advantage of optimal climatic periods and would be coordinated with other reclamation activities. In an ideal situation, earthwork and drainage control would be completed in the summer or early fall. Seedbed preparation would generally be completed in the fall, either concurrently with or immediately prior to seeding.

Off-Highway Vehicle Deterrents

Operation of off-highway vehicles (OHVs) can cause mechanical damage to stabilization structures and soils and mortality of plants. Access by such vehicles would be limited in areas of reclamation. Measures to control OHVs and other unauthorized vehicle use in the Project Area

would be determined in consultation with the BLM. Specific areas of potential access by OHVs would be identified and measures to minimize or eliminate access would be developed as appropriate. These measures may include the installation of signs, berms, fences with locking gates, and/or selectively placed boulders. Development of OHV deterrents would be determined on a case-by-case basis based on BLM requirements.

2.3. PREFERRED ACTION ALTERNATIVE

The Preferred Action Alternative is the same as the Proposed Action Alternative with the additional implementation of an Adaptive Management Plan (AMP)[3] related to groundwater pumping. The BLM would require continuous groundwater monitoring and sharing of groundwater withdrawal data from Redhawk, and annual monitoring of parameters including wetted width, thalweg depth, and hydric vegetation composition in the Greenline through Lotic AIM monitoring. Groundwater pumping and climate data, as collected and described in the AMP, would be used by BLM specialists in conjunction with groundwater elevations and AIM data to determine whether the groundwater pumping is producing negative effects on surface and groundwater, associated vegetation, and aquatic resources of Copper Creek as such effects may trigger reductions in groundwater use for project purposes as described in the AMP.

2.3.1. ADAPTIVE MANAGEMENT PLAN

An AMP, in accordance with the Department of Interior Department Manual Part 522, has been developed as a strategy to monitor and mitigate degradation of aquatic and riparian habitats and the biological communities that are supported by the ecosystem of Copper Creek due to water withdrawals for project purposes. An AMP for the Preferred Action Alternative identifies general water resource objectives; thresholds[4] for specific water resource-related parameters (groundwater levels and Copper Creek wetted width, thalweg depth, and hydric vegetation composition); methods for determining whether Preferred Action Alternative groundwater pumping is the cause of a specific water resource parameter falling below a threshold and triggered measures (specific reductions in groundwater use for project purposes for the Preferred Action Alternative) when the BLM determines that project groundwater pumping is the cause of a specific water resource parameter falling below the threshold.

Research has shown that rates of groundwater decline, as opposed to climate factors, is the primary driver of declines of riparian species (Patten 1998, Williams et al. 2022). Removal of groundwater by wells changes an aquifer system through time, the effects of pumping are

[3] "Adaptive Management (AM) is a decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. AM also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. AM does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals; increases scientific knowledge; and reduces tensions among stakeholders." (Williams et al. 2009).

[4] A threshold is the magnitude or intensity that must be exceeded for a certain reaction, phenomenon, result, or condition to occur or be manifested.

typically delayed. When pumping starts, all the pumped water comes from storage in the aquifer. However, as pumping time continues, a greater percentage of the pumping can come from "depletion," which is reduced flow in the stream and reduced use of groundwater (evapotranspiration) by plants. At any time, the only sources of pumped water are aquifer storage, reduced streamflow, and evapotranspiration. Percentages of these sources vary through time and are affected by distance to the surface water and by the properties of the aquifer (Leake et al. 2010). Hydrologic diffusivity determines how fast a disturbance such as pumping a well will propagate through an aquifer, and along with distance from a stream are the most important factors in systems with predominately horizontal groundwater flow (Barlow and Leake 2012). These systems are recharged from natural meteoric precipitation. The amount of water currently recharging many of these aquifers is insufficient to meet current and future demands (Hoffman et al. 2007).

The BLM management objective is to use adaptive management strategies to prevent loss of aquatic and riparian habitats and the biological communities that are supported by the ecosystem of Copper Creek due to water withdrawals for project purposes. Hydrological conditions are inherently variable and thus the following proposals strive for sufficient data collection and interpretation to determine foreseeable trends. Recommended management actions may then be directly linked to statistically verifiable information obtained through a refined data collection protocol and from periodic observations made by subject matter experts and specialists. To accomplish this, the BLM would require the following from Redhawk.

Groundwater Monitoring of Copper Creek

A groundwater monitoring map representing the current depth to groundwater (DTG) within and immediately adjacent to Copper Creek shall be produced by Redhawk using best available data. The evolving map will be informed by data from no less than three shallow wells (no more than 30 ft deep). Each well will be equipped with a submersible pressure probe and a data logger. Ample power will be supplied and maintained to ensure continuous function of both the probe and the data logger. There are currently three groundwater wells at various locations, agreed upon by the BLM, near to the Copper Creek channel (**Figure 4**). These probes and data loggers shall be serviced and downloaded monthly by Redhawk to produce a continuous groundwater monitoring record over the life of the project. Redhawk will provide all data from those identified existing wells and from those proposed new monitoring wells for the duration of the project; the BLM shall have continuous access to all gages and data loggers for QA/QC of collected data for the duration of the exploration project. The groundwater level map will be updated quarterly for the duration of project related activities. The resulting maps of groundwater elevations will be shared with the BLM for evaluation at the time that quarterly updates are made. The comparative baseline DTG that shall be used by the BLM in their evaluations shall be comprised of monthly averages of DTG elevations collected in the corresponding previous year periods at each specific well (e.g., Average April 2024 DTG at Well 1 will be compared to Average April 2025 DTG at Well 1). No evaluation will be produced for any well which is missing the previous year's data for a corresponding evaluation period. Each well is independently evaluated. Therefore, the conditions at any well may trigger adaptive management measures as described in this AMP.

Groundwater Withdrawal Records

Redhawk shall provide, concurrently to groundwater map updates, groundwater withdrawal logs for each well to include the location pumped, the pumping time periods, and the quantities of water pumped during each period. This information may be an important component in determining effects of groundwater pumping versus effects of natural climatic variation on the local aquifer.

Annual Lotic Assessment, Inventory, and Monitoring (AIM) Data Collection

In compliance with the Department of Interior Permanent Instruction Memorandum IM 2023-043, AIM strategy[5] will be utilized for measuring natural resource condition and trend which will inform and guide management decisions. The BLM has identified and collected AIM data for each of three reaches within Copper Creek. Fundamental data elements have been collected using AIM National Aquatic Monitoring Framework Field Protocol for Wadeable Lotic Systems (Lotic AIM, Technical Reference 1735-2, Version 2; BLM 2021). Initial data collection at the selected sites was conducted in April 2023 and again in April 2024 by crews contracted by the BLM and trained in Lotic AIM protocol. After Redhawk has secured authorization for the exploration program, Redhawk shall conduct subsequent Lotic AIM data collection annually, between April 21 and May 5, for the life of the project using trained field crews composed of either Redhawk staff or a contracted crew. Any crew collecting Lotic AIM data shall complete annual BLM Lotic AIM training and comply with the methods used in Technical Reference 1735-2 during data collection. Data will be analyzed annually by the BLM and trends will be summarized that compare data collected at each site to data collected previously at the respective site and/or with data collected during appropriate time intervals at similar sites within the Gila District.

The condition of biotic communities is directly influenced by the environment in which they exist. In arid Arizona, riparian areas are estimated to be less than 0.4 percent of the total area of the state (Zaimes et al. 2007). Their value is disproportionate to their size; for perspective, 80 percent of vertebrates spend some portion of their life in riparian areas in Arizona (Hubbard 1977). Riparian areas are complex systems and, as such, any monitoring protocol used to characterize those areas needs to rigorously account for the many variables common to all, but also unique to each individual reach. The BLM Lotic AIM protocol was developed for this use and purpose. Not all core, covariate, or contingent methods will be discussed below, although most methods data will be collected during each AIM data gathering visit. The data collected using three of these methods will be specifically utilized to determine adaptive management criteria.

Each Lotic AIM site is independently evaluated. Therefore, the conditions at any single site may trigger adaptive management measures as described in this AMP.

[5] The Bureau of Land Management (BLM) developed the National Aquatic Monitoring Framework (NAMF) (BLM 2021) to monitor the condition and trend of aquatic systems as part of the Assessment, Inventory, and Monitoring (AIM) Strategy (Toevs et al. 2011). Following the AIM principles, the NAMF standardized field sampling methodologies, electronic data capture, and the use of appropriate sample designs for wadable streams and rivers (i.e., lotic systems) (BLM 2021, Dickard et al. 2015).

Primary Indicators

Three primary fundamental elements are characterized using the Lotic AIM protocol: 1) water quality, 2) watershed functions and instream habitat (i.e., physical habitat), and 3) biodiversity and riparian habitat quality. A set of methods that describe each fundamental element has been identified and those methods are further categorized as either a core, contingent, or covariate method depending on ecosystem variables and management objectives. Three methods have been identified by the BLM for use as primary indicators of ecosystem health for the purposes of adaptive management to prevent losses of crucial riparian habitat within the Copper Creek project area.

A. Channel width.

Channel width is a characteristic of the physical habitat of a stream and a covariate method of Lotic AIM protocol. It includes the wetted width and the bankfull width of a channel and is influenced primarily by geology, gradient, discharge patterns, and water depth and velocities. Changes in discharge patterns and water depth and velocities in response to anthropomorphic activities can be detected through changes in channel width (i.e., less water in a channel would produce a narrower wetted width due to reduced baseflow).

B. Thalweg Depth Profile.

The Thalweg depth profile, or the line joining the deepest points in a channel is a characteristic of the physical habitat of a stream and a contingent method of Lotic AIM protocol. The thalweg is a suitable feature and considered a useful summary indicator for representation of the physical diversity of a reach (Bartley and Rutherfurd 2002). Physical diversity is known to correlate well with biological diversity (Jungwirth et al. 1993). The Lotic AIM Thalweg Depth Profile method measures the water depth along the thalweg. Decline of the water table may be detected as reduced water depths in the thalweg.

C. Greenline Composition.

The presence of mostly permanent water in the plant rooting zone at the margins of a channel allows growth of robust, hydrophytic plant communities in a continuous area called the Greenline, typically found on each side of a channel (Winward 2000). The plant community composition type is characterized using a protocol developed through the Multiple Indicator Monitoring (MIM) protocol (Technical Reference 1737-23) and is a method of Lotic AIM. Anthropogenic disturbances may impact vegetation through reduced vigor and community changes in response to changes in water availability at the Greenline (Burton et al. 2011).

Adaptive Management is Supported by Site-Specific Determinations of Resource Objectives

> *"Riparian areas are valuable because of their importance to watershed protection, water quality, wildlife, recreation opportunities, and livestock management. Special management attention is needed to ensure these fragile areas are protected and improved while providing for their use."*
>
> - *Safford District Regional Management Plan (RMP), 1991*

The SFO RMP, pages 20 and 32, identifies several Riparian Issues and the selected alternative sets objectives for the direction for management of Riparian Areas. These include:

1. Achieve riparian area improvement and maintenance objectives through the management of existing uses, wherever feasible.
2. Ensure new resource management plans and activity plans, and revisions of existing plans recognized the importance of riparian values and propose management to maintain, restore, or improve them.
3. Prescribe management of riparian values based on site-specific characteristics and settings.
4. Give special attention to monitoring and evaluating management activities in riparian areas and revise management practices where site-specific objectives are not being met.
5. Cooperate with and encourage the involvement of interested federal, state, and local governments, organizations, and private parties to share information, implement management, coordinate activities, and provided education on the value, productivity, and management of riparian areas.
6. Incorporate riparian area objectives into existing and future activity plans.
7. Maintain and monitor representative relict riparian areas to provide a baseline for future management decisions.

The SFO RMP, pages 33-34, identifies several Wildlife Habitat management concerns and the selected alternative sets objectives and actions for the direction for management of riparian areas. These include:

1. Maintain and enhance priority species and their habitats.
2. Manage priority wildlife species habitat (vegetation communities) or special features for that habitat (water, riparian vegetation, cliffs, etc.) to maintain or enhance population levels.
3. Establish the following as priority species and habitats. Priority species and habitats in the District include federally listed, proposed, and candidate threatened and endangered species and their habitat, important game species and their habitat, and other sensitive species and their habitat.

    – Riparian/aquatic habitat and species dependent on riparian/aquatic habitat including Gila topminnow (*Poeciliopsis occidentalis*), loach minnow *(Tiaroga cobitis*), spikedace (*Meda fulgida*), Gila chub (*Gila intermedia*), yellow-billed cuckoo, northern Mexican gartersnake (*Thamnophis eques megalops*), Huachuca water-umbel

(*Lilaeopsis schaffneriana* ssp. recurva), southwestern willow flycatcher (*Empidonax traillii extimus*), and lowland leopard frog (*Lithobates yavapaiensis*).
- Desert (*Ovis canadensis mexicana*) and Rocky Mountain (*Ovis canadensis canadensis*) bighorn sheep.
- Mule deer (*Odocoileus hemionus*).
- Sonoran desert tortoise.

a. Note: for a more complete list of BLM priority species and species of concern that are likely to occur in the project area, see the SFO RMP or recent Information for Planning and Consultation (IPaC) report from the U.S. Fish and Wildlife Service (USFWS).

4. Monitor priority habitat to determine condition and changes in condition. Conduct inventories to determine the impacts of other activities on wildlife populations and habitat. Identify opportunities to mitigate adverse impacts and implement actions needed to correct the problems.

Resource Objectives and Associated Adaptive Management Actions

Groundwater is not static. It is part of a dynamic flow system. It moves into and through aquifers from areas of high water-level elevation to areas of low water-level elevation. Groundwater-level fluctuations due to aquifer storage changes involve either the addition or extraction of water from the aquifer, both through natural means and human involvement (Bridges 2020). Seasonal variation of groundwater levels is an expectation in systems such as Copper Creek. Typically, winter storms, spring runoff, and late summer/fall monsoonal events provide surface flow and groundwater recharge. These factors (climate), along with geology, land use, vegetative consumption and evapotranspiration affect water table levels. In unconfined aquifers such as those that occur in the Basin and Range, the water level in a well is a direct indicator of the amount of groundwater stored at a given time. The DTG is an important metric for habitat condition because dependent root systems of riparian species such as Fremont's Cottonwood (*Populous fremontii*) are relatively shallow. Monthly averages of DTG determined through mapping and monitoring using data collected prior to and throughout implementation of this project will define the expected range of variability of the water table in the project area of Copper Creek.

This AMP recognizes the importance of establishing meaningful trends in surface and groundwater system changes, particularly considering the known effects of groundwater withdrawals and of climate change. Upon receipt of quarterly map updates, the BLM will evaluate water table levels. Thoughtful consideration of all factors and available information will be made prior to triggering the adaptive management measures described herein. The primary objective is balanced use to meet the BLM's multiple use mandate. The management objectives described in this document are intended to be independent of each other; management actions can be derived from the results of data collection and/or observations in relation to any one of the physical indicators identified in this document. Because causality is complex in ecosystems such as Copper Creek, management must have the ability to adapt in consideration of the best available information as it becomes available.

- **Adaptive Management Objective 1**: Determine the extent of DTG change through quarterly evaluation of the monitoring map data. If it is determined by the BLM that DTG is increasing and groundwater withdrawal for the project is the causal factor, then mitigate ongoing potential impacts by appropriately reducing groundwater withdrawals for the project purposes on BLM lands according to the following guidelines. A substantial effort will be made in discerning the causes of increases in DTG, including review of groundwater levels and surface flow data, mandatory site visits and evaluations using Lotic AIM, PFC, and/or MIM protocols, and weather and climate data sources such as Western Regional Climate Center (WRCC) and Parameter-elevation Regressions on Independent Slopes Model (PRISM). In application of these guidelines, some flexibility to determine the actual percentage of reductions within these guidelines for any given evaluation period is reserved at the discretion of BLM decision-makers to facilitate more precise calibrations to balance demands.

    1. If the DTG is within expected ranges relative to baseline data (i.e., the previous period average DTG data at a specific site), no reductions of ground water withdrawals for project purposes on BLM lands will be implemented. The expected range of DTG will be determined by BLM through robust evaluation of relevant data and in consideration of seasonal variation and climate effects.
    2. If the DTG is between 1 ft and 2 ft lower than expected DTG elevations relative to baseline data (i.e., the previous period average DTG data at a specific site) and considering recent climate conditions, Redhawk shall reduce groundwater withdrawals for the project purposes on BLM lands by up to 25 percent of the total water volume extracted during the previous period, from Hendrickson Wells pending the next evaluation period's determination.
    3. If the DTG is between 2 ft and 3 ft lower than expected DTG elevations relative to baseline data (i.e., the previous period average DTG data at a specific site) and considering recent climate conditions, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 25 to 75 percent of the total water volume extracted during the previous period, from Hendrickson Wells pending the next evaluation period's determination.
    4. If the DTG is 3 ft or greater below expected DTG elevations relative to baseline data (i.e., the previous period average DTG data at a specific site) and considering recent climate conditions, Redhawk shall discontinue groundwater withdrawals for project purposes on BLM lands from Hendrickson Wells pending the next evaluation period's determination.

       Note: If groundwater withdrawals for project purposes on BLM lands are required to be reduced, concurrent monitoring using Proper Functioning Condition Protocol (PFC) and/or Lotic AIM Protocol by an appropriate Interdisciplinary Team (IDT) will occur during the following evaluation period to determine the degree of potential resource impacts. Groundwater withdrawals for project purposes on BLM lands may be restored to proposed levels following BLM evaluation of contributing factors.

- **Adaptive Management Objective 2**: Determine that channel width (wetted width as measured during Lotic AIM data collection) is not reduced due to groundwater withdrawals. If it is determined by the BLM that wetted width is reduced and that groundwater withdrawals for project purposes on BLM lands is the causal factor, then mitigate ongoing potential impacts by appropriately reducing groundwater withdrawals for project purposes on BLM lands according to the following guidelines. A substantial effort will be made in discerning the causes of reductions in wetted width, including review of groundwater levels and surface flow data, mandatory site visits and evaluations using Lotic AIM and/or PFC protocols, comparison to other relevant Lotic AIM sites, and weather and climate data sources such as Western Regional Climate Center (WRCC) and Parameter-elevation Regressions on Independent Slopes Model (PRISM). In application of these guidelines, some flexibility to determine the actual percentage of reductions within these guidelines for any given evaluation period is reserved at the discretion of BLM decision makers to facilitate more precise calibrations to balance demands.

    1. If the average wetted width is within 25 percent compared to the average wetted width determined through Lotic AIM data collection in the previous year and considering climate variations, no reductions of ground water withdrawals for project purposes on BLM lands will be implemented.
    2. If the average wetted width is reduced by 25 to 50 percent compared to the average wetted width determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 25 to 50 percent of the total water volume extracted during the previous year from Hendrickson Wells pending the next evaluation period's determination.
    3. If the average wetted width is reduced by 50 to 75 percent compared to the average wetted width determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 50 to 75 percent of the total water volume extracted during the previous year from Hendrickson Wells pending the next evaluation period's determination.
    4. If the average wetted width is reduced by 75 percent or greater compared to the average wetted width determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall discontinue groundwater withdrawals for project purposes on BLM lands from Hendrickson Wells pending the next evaluation period's determination.

       Note: If groundwater withdrawals for project purposes on BLM lands are required to be reduced, concurrent monitoring using PFC and/or Lotic AIM Protocol by an appropriate IDT will occur during the following evaluation period to determine the degree of potential resource impacts. Groundwater withdrawal may be restored to proposed levels following BLM evaluation of contributing factors.

- **Adaptive Management Objective 3**: Determine that water depth in the thalweg as measured during Lotic AIM data collection is not reduced due to groundwater withdrawals for project purposes on BLM lands. If it is determined by the BLM that thalweg depth is reduced and that groundwater withdrawal for project purposes on BLM lands is the causal factor, then mitigate ongoing potential impacts by appropriately reducing groundwater withdrawals for project purposes on BLM lands according to the following guidelines. A substantial effort will be made in discerning the causes of reductions in water depth in the thalweg, including review of groundwater levels and surface flow data, mandatory site visits and evaluations using Lotic AIM and/or PFC protocols, comparison to other relevant Lotic AIM sites, and weather and climate data sources such as Western Regional Climate Center (WRCC) and Parameter-elevation Regressions on Independent Slopes Model (PRISM). In application of these guidelines, some flexibility to determine the actual percentage of reductions within these guidelines for any given evaluation period is reserved at the discretion of BLM decision makers to facilitate more precise calibrations to balance demands.

    1. If the average water depth in the thalweg is within 25 percent compared to the average thalweg depth determined through Lotic AIM data collection in the previous year and considering climate variations, no reductions of ground water withdrawals for project purposes on BLM lands will be implemented.
    2. If the average water depth in the thalweg is reduced by 25 to 50 percent compared to the average thalweg depth determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 25 to 50 percent of the total water volume extracted during the previous year from Hendrickson Wells pending the next evaluation period's determination.
    3. If the average water depth in the thalweg is reduced by 50 to 75 percent compared to the average thalweg depth determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 50 to 75 percent of the total water volume extracted during the previous year from Hendrickson Wells pending the next evaluation period's determination.
    4. If the average water depth in the thalweg is reduced by 75 percent or greater compared to the average thalweg depth determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall discontinue groundwater withdrawals for project purposes on BLM lands from Hendrickson Wells pending the next evaluation period's determination.

       Note: If groundwater withdrawals are required to be reduced, concurrent monitoring using PFC and/or Lotic AIM Protocol by an appropriate IDT will occur during the following evaluation period to determine the degree of potential resource impacts. Groundwater withdrawals for project purposes on BLM lands may be restored to proposed levels following BLM evaluation of contributing factors.

- **Adaptive Management Objective 4**. Determine that the percentage of hydric plants present in the Greenline riparian vegetation communities as measured during Lotic AIM data collection are not affected by groundwater withdrawals for project purposes on BLM lands. If it is determined by the BLM that these communities are impacted and that groundwater withdrawals for project purposes on BLM lands is the causal factor, then mitigate ongoing potential impacts by appropriately reducing groundwater withdrawals for project purposes on BLM lands according to the following guidelines. A substantial effort will be made in discerning the causes of reductions in the percentage of hydric plants in the Greenline riparian vegetation communities, including review of groundwater levels and surface flow data, mandatory site visits and evaluations using Lotic AIM, PFC, and/or MIM protocols, comparison to other relevant Lotic AIM sites, and weather and climate data sources such as Western Regional Climate Center (WRCC) and Parameter-elevation Regressions on Independent Slopes Model (PRISM). In application of these guidelines, some flexibility to determine the actual percentage of reductions within these guidelines for any given evaluation period is reserved at the discretion of BLM decision makers to facilitate more precise calibrations to balance demands.

    1. If the total composition of hydric plants on the Greenline is reduced by less than 25 percent compared to the total percent composition of hydric plants on the Greenline determined through Lotic AIM data collection in the previous year and considering climate variations, no reductions of ground water withdrawals for project purposes on BLM lands will be implemented.
    2. If the total composition of hydric plants on the Greenline is reduced by 25 to 50 percent compared to the total percent composition of hydric plants on the Greenline determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 25 to 50 percent of the total water volume extracted during the previous year from Hendrickson Wells pending the next evaluation period's determination.
    3. If the total relative abundance of hydric plants on the Greenline is reduced by 50 to 75 percent compared to the total percent of relative abundance of hydric plants on the Greenline determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall reduce groundwater withdrawals for project purposes on BLM lands by 50 to 75 percent of the total water volume extracted during the previous year from Hendrickson Wells pending the next evaluation period's determination.
    4. If the total Greenline relative abundance of hydric plants is reduced by 75 percent or greater compared to the total percent of relative abundance of hydric plants on the Greenline determined through Lotic AIM data collection in the previous year and considering climate variations, Redhawk shall discontinue groundwater withdrawals for project purposes on BLM lands from Hendrickson Wells pending the next evaluation period's determination.
       Note: If groundwater withdrawals for project purposes on BLM lands are required to be reduced, concurrent monitoring using PFC and/or Lotic AIM Protocol by an appropriate IDT will occur during the following evaluation period to determine the

degree of potential resource impacts. Groundwater withdrawals for project purposes on BLM lands may be restored to proposed levels following BLM evaluation of contributing factors.

Supplemental: Priority Native Woody Riparian Vegetation

Native woody riparian vegetation is a contingent method of the Lotic AIM protocol, and it describes several key characteristics of physical habitat which have direct implications for water quality and the quality of habitat critical to various species. Since shallow groundwater along rivers interacts with surface water, anthropogenic alteration of streamflow and pumping of local aquifers are often at odds with the flow needs for various species and can induce water stress to both aquatic and terrestrial species at critical life stages (Rohde et al. 2021). Several phreatophytes, including *Populus* ssp. and *Salix* ssp., provide canopy cover, critical bank stabilization, reduce evaporation and regulate water and soil temperature, provide nutrients and nutrient cycling, and provide physical habitat, among other ecosystem functions in Copper Creek. Decline of the water table may be detected by reduced vigor (leaf senescence), low recruitment, exposed branches (leaf abscission), and increased mortality in riparian woody species (Amlin and Rood 2003).

Lotic AIM collects only the presence and absence of these species. Decline in abundance of Priority Native Woody Riparian Vegetation would likely not be detectable during the timespan of the proposed project due to delayed affects. However, the health of these communities is appropriately assessed using PFC (Technical Reference 1737-15). IDT observations using this PFC protocol (e.g., diversity, age class, vigor, etc.) will be useful in conjunction with Lotic AIM data to determine the overall health of these critical components, better informing decision-makers in the application of this AMP.

2.4. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The following alternatives were considered and briefly analyzed below but were ultimately eliminated from further consideration.

2.4.1. OFFSITE WATER SOURCE ALTERNATIVE

Under this alternative, water would not be obtained for exploratory purposes from the Hendrickson or Solar wells and instead would be hauled in from an offsite source. A standard water truck may carry up to 4,000 gallons of water, while large ones can carry 5,000 to 10,000 gallons. To meet project water requirements, approximately 35 trucks with 4,000-gallon capacity would be needed each month to deliver water to support operation for two drill rigs (140,000 gallons total). This alternative was eliminated from further detailed analysis as it may create more resource conflicts due to increased vehicle traffic, dust, emissions, and increased chances of wildlife impacts due to a standard water truck traversing the site daily. Additionally, this alternative may not eliminate pumping from private wells to fill the water trucks.

2.4.2. RIPARIAN AREA EXCLUSION ALTERNATIVE

This alternative would eliminate project-related actions within a buffered polygon around the Copper Creek channel. A primary impact from the proposed project is aquatic and riparian habitat degradation within Copper Creek from low water road crossings and from road traffic in the uplands. This alternative would exclude project-related vehicle traffic within the Copper Creek channel and adjacent uplands to avoid impacts to sensitive areas. This alternative was eliminated from further detailed analysis because it would not meet the project purpose, as vehicles would be prevented from accessing the Project Area.

2.4.3. LIMITED OPERATING HOURS ALTERNATIVE

This alternative was developed to reduce noise and lighting impacts to wildlife from the proposed action. This alternative would establish operating hours between sunrise and sunset (or dawn and dusk), which would eliminate the need for and use of artificial lighting and subsequent operational noise at night. Emergency lighting may be stationed on site in the event it is needed after hours. Motion-sensing security lights and/or alarms may be used to secure the proposed project site. This alternative was eliminated as lack of artificial lighting would reduce operating hours by approximately 50 percent and may extend or double the estimated project timeline. Additionally, with the drilling technique used, the drill likely cannot be turned off without running the risk of the drill string seizing due the loss of buoyancy and pore pressure in the borehole. Because of these reasons, this alternative was eliminated from further consideration.

3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

3.1. INTRODUCTION

Section 3.0 contains the impacts analysis related to the issues presented in **Section 1.6**. This section describes: 1) the affected environment, specifically the existing or baseline conditions relevant to each issue identified in **Section 1.6**, followed by 2) a description of the direct, indirect, and cumulative impacts projected to result from each alternative for comparison between the impacts/consequences of alternatives, and the past, present, and foreseeable land uses, and actions with effects in the impact area of analysis.

The BLM has a multiple-use mandate that includes management of habitat for sensitive species, wildlife, fish, and other aquatic organisms using several BLM manuals for guidance on species management. Those manuals include BLM MS 6500: *Wildlife and Fisheries Management* (BLM 1988), BLM MS 6720: *Aquatic Resources Management* (BLM 1991a), BLM MS 6780: *Habitat Management Plans* (BLM 1981) and *BLM Manual 6840: Special Status Species Management* (BLM 2008). The RMP for the Safford District (BLM 1991b) (now the SFO of the Gila District) was "*designed to respond to the issues and management concerns in a manner that provides a balanced approach to multiple use management. It provides protection to sensitive resources that cannot tolerate disturbance from other activities. It also provides for the consumptive use and development of other resources.*"

3.2. RESOURCE ISSUES

The ID Team evaluated potential impacts from the Proposed Action Alternative to determine which resources required detailed analysis. **Appendix A** is a table of the resources one may or may not encounter in the Project Area. Resources that are not impacted (NI) or not present (NP) are not analyzed. Resources that are present with potential for relevant impact (PI) are analyzed in this section.

The resources brought forward for analysis in this section are Wildlife and Water (Streams, Riparian Areas, Wetlands, Floodplains, Surface Water Quality). Four issue statements have been developed and categorized among the resources, as shown in the following text.

Wildlife Resources Issue Statements

1. How would each alternative impact game and nongame species of wildlife (habitat degradation and loss, loss of surface water, noise pollution, light pollution, and introduction of invasive species or spread of existing invasive species)?
2. Across each alternative, what is the potential for impacts to occur to BLM sensitive species as well as threatened and endangered species within the Project Area (habitat degradation and loss, loss of surface water, noise pollution, and introduction of invasive species or spread of existing invasive species)?

3. The Project Area is within a wildlife connectivity area identified by the Arizona Game and Fish Department (AGFD); how would each alternative impact wildlife connectivity and movements?

Water Resources Issue Statement

4. What are the potential impacts to hydrologic and hydrologic-dependent resources associated with Copper Creek due to groundwater withdrawals as stated in each alternative?

3.3. CUMULATIVE EFFECTS STUDY AREA

The description of the Affected Environment is the same for the No Action Alternative, Proposed Action Alternative, and the Preferred Action Alternative.

For the purpose of this EA, the cumulative impacts are the sum of all past, present, and reasonably foreseeable future actions (RFFAs)[6] resulting primarily from recreation, hunting, grazing, and mineral exploration and mining. The purpose of the cumulative analysis in the EA is to evaluate the incremental contributions of each alternative to the environment within the Cumulative Effects Study Area (CESA) identified for each resource issue carried forward for detailed analysis. The extent of the CESAs can vary by each resource issue, based on the geographic or biological limits of that resource, although the BLM determined that a single CESA was appropriate for all resource issues in this EA. In addition, the length of time for cumulative effects analysis varies according to the duration of impacts from the respective alternatives on the resource. **Table 3-1** defines the CESA. **Figure 6** depicts the CESA. **Table 3-2** identifies the Past, Present, and RFFAs incorporated into the analysis.

Table 3-1. Cumulative Effects Study Area

Issue Question Numbers	CESA Boundary Description	Acreage
1-4	The portion of the Tucson Wash subwatershed (HUC 1505020308) east of the San Pedro River	92,257

[6] *Reasonably foreseeable future actions* include those federal and non-federal activities not yet undertaken, but sufficiently likely to occur, that a Responsible Official of ordinary prudence would take such activities into account in reaching a decision. These federal and non-federal activities that must be considered in the analysis of cumulative impact include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by the bureau. Reasonably foreseeable future actions do not include those actions that are highly speculative or indefinite (43 CFR Part 46 Subpart A 46.30).

Table 3-2. Disturbance Acreage of Past, Present, and RFFAs in the CESA by Activity Type

CESA	Mineral Activities[1]	Agriculture[1]	Residences, Other Structures and Fields, etc.[1]	Grazing Allotments[2]	Rights-of-Way[3]	Wildfires[4]
Past and Present Actions	111 ac[1, 3]	1,000 ac	250 ac	40,000 ac	13.8 ac	604 ac
Reasonably Foreseeable Future Actions	5 ac[5]				--	
CESA Total	**115 ac**	**1,000 ac**	**250 ac**	**40,000 ac**	**13.8 ac**	**604 ac**

[1] Estimated based on visibility on aerial photograph, includes 5 ac of Copper Fox Sombrero Butte Exploration, 5 ac of Redhawk Notice-level road improvements in BLM LR 2000, and 4.1 acres of Notice-level exploration by Redhawk on BLM lands, including 1 acre that is not covered by this EA.
[2] Estimated from grazing allotment layer (BLM National Operations Center 2021)
[3] From BLM Mineral & Land Records System (BLM 2024).
[4] From National Interagency Fire Center (2023).
[5] Redhawk pads not on BLM lands.

3.4. ISSUES ANALYZED IN DETAIL

The four Resource Issues identified in **Section 1.6** are addressed in detail in the following sections.

3.4.1. ISSUE STATEMENT 1

1. How would each alternative impact game and nongame species of wildlife (habitat degradation and loss, loss of surface water, noise pollution, light pollution, and introduction of invasive species or spread of existing invasive species)?

3.4.1.1. AFFECTED ENVIRONMENT

Environmental Conditions

The Project Area consists primarily of steep-sloped, rocky bedrock units at elevations ranging from approximately 3,600 to 4,800 ft above mean sea level (amsl). Set within the slopes are numerous ephemeral drainages and areas with perennial surface water and associated aquatic and riparian vegetation, including Copper Creek, Bootlegger Spring, and Number 19 Spring, and vegetation that is influenced by Hendetta Spring, which is located off BLM lands (**Figure 4**). These upland and riparian areas provide resources for various game and nongame wildlife species.

This Project Area is mapped within a vegetation community transitional area. Generally climbing in elevation and varying by slope aspect, these communities include Arizona Upland subdivision of the Sonoran Desertscrub biotic community, Semidesert Grassland biotic community, Interior Chaparral biotic community, and Madrean Evergreen Woodland biotic community (The Nature Conservancy 2012).

Portions of Copper Creek have perennial surface water or groundwater levels that support streamside obligate riparian vegetation species. Adjacent plant communities are dominated by upland species with some preferential riparian plant species. Ephemeral drainages in the Project Area generally support a discontinuous xeroriparian vegetation community interspersed with bedrock embankments. Vegetation along the ephemeral wash banks include mainly upland species that are sometimes larger and at a higher density than those that occur in adjacent upland areas.

In addition to riparian conditions along portions of Copper Creek, the BLM identified Hendetta Spring, Bootlegger Spring, and Number 19 Spring (**Figure 4**) as springs of interest for the Proposed Action. WestLand, Redhawk, and BLM staff visited the three springs in October and November 2022. Bootlegger Spring was visited by WestLand on both October 27 and November 22, 2022, observing surface water in a reach of the channel. Bootlegger Spring was visited by BLM Staff on October 17, 2022. During that time, flowing surface water was observed in the mapped location of Bootlegger Spring, and BLM observed several facultative and facultative-wetland species within the reach, including deergrass, *Baccharis* sp., and cottonwood, suggesting that water is at least intermittently available in most years at this site. No lowland leopard frogs, Sonora mud turtles (*Kinosternon sonoriense sonoriense*), Aravaipa sage (*Salvia amissa*), or big sedge (*Carex spissa*) were found in Bootlegger Spring or on BLM land downstream from Hendetta Spring during WestLand's site visit. The Bootlegger Spring area has the potential to provide suitable habitat for the lowland leopard frog and Sonora mud turtle on a temporary basis.

BLM and Redhawk staff visited the Number 19 Spring area in November 2023. Although a spring was not located, pools of water and facultative vegetation were noted in the channel near the mapped location.

The Project Area includes a portion of the Santa Catalina/Rincon – Galiuro Connectivity Assessment corridor (**Appendix C**). This wildlife corridor is discussed in further detail in **Section 3.4.3**.

Abandoned mine workings are common within the Project Area, and many have been closed for safety (WestLand 2012). The mine workings that are still accessible to wildlife (*e.g.*, old adits and shafts) may provide a potential source of shelter. The opportunities for natural cave development are limited by incompatible rock types within the Project Area (WestLand 2012).

The Project Area's vegetation serves as a resource for both game and non-game wildlife species, offering essential forage, shelter, and nesting sites. The aquatic habitat within Copper Creek is a crucial source of drinking water and supports the aquatic lifecycle of various species, such as lowland leopard frog, Sonora mud turtle, and black-necked gartersnakes (*Thamnophis cyrtopsis*). Additionally, the riparian vegetation associated with these aquatic resources provides critical forage, shelter, and nesting opportunities, attracting species that might otherwise be absent from the area. Both game and non-game species may traverse the Project Area to access these resources.

Game Species

Predicted range models for ten Species of Economic and Recreation Importance (game species) intersect the project footprint, as provided by the (AGFD Heritage Data Management System online environmental review tool (ERT; **Appendix C**). These species are also listed in further detail in **Appendix D, Table 4**. Species-specific surveys have not been conducted at Copper Creek for the game species, but the following five of the ten have been confirmed present during field investigations in 2012, 2022, and/or 2023:

- Deer (*Odocoileus* sp.)
- Mountain lion (*Felis concolor*)
- Black bear (*Ursus americanus*)
- Mourning dove (*Zenaida macroura*)
- Gambel's quail (*Callipepla gambelii*).

Nongame Species

AGFD range models indicate 69[7] nongame wildlife species of greatest conservation need have predicted ranges that intersect the Project Area (**Appendix C**). These species are also listed in **Appendix D, Table 5**. Field investigations have not been conducted within the Project Area with the objective of determining the presence of all nongame wildlife species of greatest conservation need, but the presence of several species has been confirmed through various field visits. Species on the list that were confirmed present during field investigations in July and August 2012 (WestLand 2012) and by WestLand and the BLM during field investigations in support of this EA include:

- Bell's vireo (*Vireo bellii*)
- Gila woodpecker (*Melanerpes uropygialis*)
- Harris' antelope ground squirrel (*Ammospermophilus harrisii*)
- Lowland leopard frog (*Lithobates yavapaiensis*)
- Sonora mud turtle (*Kinosternon sonoriense sonoriense*)
- Black-necked gartersnake (*Thamnophis cyrtopsis*)
- California leaf-nosed bat (*Macrotus californicus*) (possible sign)
- Pale Townsend's big-eared bat (*Macrotis townsendii pallescens*)
- Myotis bats (*Myotis* sp.)

The California leaf-nosed bat, lowland leopard frog, certain *Myotis* bats, and Sonora mud turtle are BLM Sensitive species and are considered with other BLM Sensitive species in **Section 3.4.2**.

[7] BLM-sensitive and threatened and endangered species are not included here as they are discussed in Issue Statement 2.

3.4.1.2. NO ACTION ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, impacts to game and nongame species and their habitats would be consistent with current land use, including recreation, camping, motorized all-terrain vehicle use, and grazing, as well as minimal mineral exploration, which would be expected to continue at similar levels to current use in the Project Area and surrounding lands.

3.4.1.3. PROPOSED ACTION ENVIRONMENTAL CONSEQUENCES

The Proposed Action Alternative may directly affect game and nongame wildlife species within the vicinity of active drill pads and road widening activities. There is a potential risk of harassment, injury, and mortality of individual wildlife species. Direct impacts to individual game or nongame species would result from ground disturbance or collisions with and crushing by vehicles. Indirect effects may result from habitat loss or degradation and disturbance through human presence, introduction of invasive species or spread of existing invasive plant species from vehicles and equipment, noise and vibrations from drilling, nighttime lighting, and fugitive dust resulting from traffic, road improvements, drill site operations, and reclamation activities. The resulting indirect effects could include decreases in foraging success, access to shelter and surface water, avoidance of predators, detection of prey, and breeding and other behaviors of game and nongame species, including life functions of aquatic species. Game and nongame species may temporarily vacate or avoid those portions of the Project Area where surface disturbing and/or drilling activities are occurring.

Proposed Action activities associated with drilling are expected to be conducted 24 hours per day, 7 days per week, 365 days per year, excluding an estimated 3 months per year when hazardous weather such as monsoons prevents work, and planned shutdowns.

Surface Disturbance

Surface disturbance would consist of clearing the previously used pads and roadways to make them safe for drilling activities. Many of these sites have been naturally revegetated to various degrees, supporting grasses, forbs, shrubs, and subshrubs. Lack of vegetation persists in areas where continued disturbance, active erosion, or degraded soil quality has prevented seedling establishment and natural revegetation. Ground disturbance may increase the colonization of disturbed areas by noxious and invasive plant species. If unchecked, invasive plant species can displace native species and change habitat, affecting forage suitability of an area for game and nongame species and potentially affect cover opportunities. Some invasive plant species can promote the spread of wildfires. Game and nongame species dependent on the current vegetation in those areas for forage, cover, or other activities would lose that habitat until reclamation has returned the disturbed areas to a level of productivity comparable to levels prior to Proposed Action activities. Approximately 18 ac of surface disturbance are anticipated for the project. Disturbance would consist primarily of vegetation removal that had become established within the previously used pads and roads, expansion of pads where needed to either 40-ft x 60-ft or 70-ft x 70-ft dimensions, and widening of roads where needed to 12 ft, pursuant to the project plan. Design features and BMPs incorporated into the Proposed Action for vegetation and control of invasive plant species (**Section 2.2.10**) would reduce effects of vegetation loss and

habitat changes to game and nongame species by minimizing vegetation disturbance and providing for native vegetation recovery at Project completion. Effects from surface disturbance are not expected to cause a change in the population stability of any game or nongame species.

Groundwater Pumping

Groundwater pumping from the private-land wells has the potential to affect the availability of surface water and lower the groundwater table within the Project Area. It could also reduce vegetation leading to less cover and forage for wildlife. The reduction in surface waters can also impact aquatic invertebrates, which are a crucial foods source for many species. In **Section 3.4.4**, a detailed discussion is provided for project groundwater pumping and its potential impacts on hydrologic and hydrologic-dependent resources associated with Copper Creek. Specific to game and nongame species, it is important to note that even small changes in water availability can have moderate to major impacts to game and nongame species and their habitats. Design features and BMPs for water resources may lessen these impacts (**Section 2.2.10**). Effects from the loss of surface water or groundwater can lead to habitat degradation, which could eventually impact population stability of game or nongame species.

Noise

Noise and vibrations from the drill rigs may affect the ability of game and nongame species to communicate and to detect predators, prey, and general threats. Effects of elevated sound levels from project activities on game and nongame species would vary by species, depending on the range of sounds that they hear and by which they communicate. Communication between individuals could be impeded. The ability of prey species to detect predators could be affected, as could the ability of predators to detect prey. Bat species using echolocation to locate prey could be affected by project sounds within the frequencies of their echolocation, which often include ultrasonic frequencies and varies by species, while many other wildlife species could be affected by sounds within the human hearing range. Bats could also be affected by noise at roost sites, causing disruption of torpor or site abandonment. Although studies have found that hibernating bats are not sensitive to non-tactile stimuli such as noise (Speakman, Webb, and Racey 1991, Summers et al. 2023), roost abandonment can occur due to anthropogenic disturbance that includes a noise factor. The variation in effects among species includes the distance from a sound source in which different game and nongame species would be affected. The sound attenuation rate increases with sound frequency, so noise interference of ultrasonic frequencies would occur over a smaller distance than for lower frequencies.

Noise associated with the project includes construction and re-establishment of drill pads and select access roads; drilling activities anticipated to occur for up to 3 years with an estimated 9 months of activity per year with breaks for weather (monsoon season) or other reasons; and during reclamation activities. Up to two drill rigs would operate at any given time.

Noise emission increases from the Project Area would be localized to the one or two active pads and access road locations, attenuating with distance. Maximum daytime project noise levels would result from drilling, pad clearing, and reclamation activities. Nighttime noise levels would

result from drilling operations only, for 24 hours a day while drilling was active at each drill site, a period varying from approximately 1 to 4 weeks.

Noise levels and attenuation are quantifiable, although various environmental factors produce some variability in attenuation rates. Sound pressure levels decrease by 6 decibels (dB) per doubling of distance (FHWA 2006). This only accounts for attenuation due to geometric spreading and does not account for attenuation due to atmospherics, ground attenuation, and intervening topography, and will therefore overpredict the sound level at distances greater than those used within the calculation.

To determine noise levels and attenuation of drill rig noise from drill pads, Redhawk recorded sound level readings at distances of 50 ft, 100 ft, 200 ft, and 300 ft from the front, back, and sides of a drill rig. They also recorded sound level readings at the drill rig while the rig was shut down and while the rig was running and recorded ambient sound levels at two road crossings of Copper Creek. The drill rig used for the noise measurements was on private lands approximately 600 ft from the nearest Proposed Project pad. The drill rig is one that would be used for the project or is of similar construction, with the exception that a secondary muffler would be installed on project drill rigs, dampening the sound level from that recorded during the measurements. Sound level readings were accomplished with a cell phone microphone that had the National Institute for Occupational Safety and Health Sound Level Meter (NIOSH SLM) application[8] installed. This application has met NIOSH lab testing criteria for accuracy and is promoted for sound measurement by NIOSH, which is part of the National Centers for Disease Control. Data from those readings is presented in **Table 3-3**.

[8] https://blogs.cdc.gov/niosh-science-blog/2017/01/17/slm-app/

Table 3-3. Drill Sound Attenuation Data[1]

Location	Distance from Drill Rig	dBA
At drill rig, not running	0 ft	29.2
At drill rig, running	0 ft	92.2
Drill rig front	50 ft	74.4
	100 ft	62.9
	200 ft	60.8
	300 ft	42.0
Drill rig back	50 ft	77.2
	100 ft	67.7
	200 ft	65.0
	300 ft	63.6
Drill rig right (control panel) side	50 ft	74.1
	100 ft	61.0
	200 ft	45.7
	300 ft	n/a[2]
Drill rig left (bean pump) side	50 ft	64.4
	100 ft	60.3
	200 ft	48.3
	300 ft	48.1
Western Copper Creek Crossing[3]	0 ft	38.4
Copper Creek Crossing at Settling Ponds[3]	0 ft	32.6

[1] Sound readings are from a drill rig that would be used for the project or is of similar construction, except a secondary muffler would be installed to dampen sound.
[2] Due to a severe slope encountered beyond 200 ft from the drill rig, a reading at 300 ft could not be collected.
[3] Ambient sound levels

Among the readings from the four sides of the drill rig, the average sound pressure level, LAeq,[9] was highest from the back of the drill rig, at 77.2 A-weighted decibels (dBA).[10] The maximum reading at 300 ft from the drill rig was 63.6 dBA, also from the back of the rig. This is consistent with predicted attenuation: 77.2 dBA at 50 ft from a source is predicted to attenuate to 61.6 dBA at 300 ft and to further attenuate to 57.2 dBA at 500 ft (WestLand 2024, WKC Group 2024; accessed May 1, 2024). In terms of common noises, 57.2 dBA is greater than the noise level of a

[9] LAeq = Equivalent Continuous Sound Pressure Level, the constant noise level that would result in the same total sound energy being produced over a given period.

[10] dBA is an expression of the relative loudness of sounds as perceived by the human ear. Human auditory thresholds in quiet and in noise are approximately 6 dB better than that of the typical bird (Dooling and Popper 2016); i.e., human hearing is more sensitive than that of typical birds.

refrigerator or light automobile traffic at 100 ft (approximately 50 dBA) but less than the noise level of normal conversation (approximately 60 dBA) (Bureau of Reclamation 2008).

Thresholds for noise that would affect species are expected to vary in numerous ways, including the species considered, the behaviors monitored, the sound frequencies of the noise, the duration of the noise, and the ambient environmental conditions, to name a few. Lacking data for specific species and conditions, it may be useful to look at guidelines that have been established for situations that are similar to the situation under consideration. An example of a US government use of noise level thresholds for wildlife protection is a recommendation by the USFWS for noise reduction measures if operations noise exceeded 69 dBA (approximately double the sound of normal conversation) within 50 meters (164 ft) of a Mexican spotted owl (*Strix occidentalis lucida*) nest site or Protected Activity Center (USFWS 2012). While this guideline was established for a bird, the species is known to be highly reliant on sound for foraging and the guideline was established for a critical life cycle event for the species. It is likely that the guideline noise around MSO nest sites would have some relevance across many groups of wildlife.

Effects of noise may cause game and nongame species to temporarily abandon or avoid the active pads and roads and an area around those locations. The farthest-reaching effect from active pads is expected to be noise from active drill rigs and machinery during site preparation and reclamation, of which site preparation would be completed within a single day at each pad. Based on the sound attenuation described above and project design features and BMPs for noise (**Section 2.2.10**), the area of effect is expected to be approximately 500 ft in all directions of active pads. A 70-ft x 70-ft pad with a 500-ft buffer includes approximately 26 ac. Effects from noise are not expected to cause a change in the population stability of any game or nongame species due to mitigation of noise effects by installation of secondary muffler on drilling rigs.

Project vibrations would emanate from the same sources as noise, primarily including drilling operations, and could primarily affect bats at roost sites. Vibrations in relation to bats is discussed further below.

Lighting

Nighttime lighting could affect behaviors of game and nongame species, with some species avoiding lit areas while others are drawn towards nighttime lighting. Depending on the species, this could alternatively lead to more susceptibility to predators, less exposure to predators that avoid lit areas, availability of prey, or loss of resources in the lit area due to avoidance of the area.

External lighting at pads would be kept to the minimum required for safety and security purposes. All lighting fixtures would be hooded and shielded. Lights would be directed down toward the interior of the project site, except where necessary for safety, to avoid light pollution and its effects on wildlife. Light attenuation is expected to be high over a short distance: four 1,250-watt metal halide floodlights, each 137,155 lumens (12,770 footcandles) mounted on 25-ft poles aimed straight down 90 degrees apart had more than 99-percent light attenuation (to less than 1 footcandle) within 60 ft of the source (Independent Testing Laboratories 2013). Effects

from nighttime lighting are not expected to cause a change in the population stability of any game or nongame species.

Dust

Fugitive dust may be generated from the project. On roads, while noise and nighttime lighting from passing vehicles is of a very temporary nature, settling dust can persist on the surrounding landscape. Dust can affect the growth processes of vegetation and alter the structure of plant communities in an area (Farmer 1993), thus potentially affecting habitat for game and nongame species. Dust loads produced within an area typically decrease exponentially with distance, such that more than 70 percent of the total dust is deposited within 33 ft of the dust production area, and more than 90 percent within 98 ft (Walker and Everett 1987). However, considering that the project will generate dust mainly during travel to and from the site, during pad construction and road maintenance and improvement activities, and will minimize fugitive dust through dust suppression efforts, the potential effects of dust on wildlife and vegetation are expected to be similar to existing conditions within the Project Area. Dust suppression design features and BMPs are provided in **Section 2.2.10**. Effects from fugitive dust are not expected to cause a change in the population stability of any game or nongame species.

Game and Nongame Species

Different groups of game and nongame species may be affected by the above factors in different ways. The game and nongame species identified in the AGFD ERT include large mammals, small mammals (including bats), birds, lizards, amphibians, and fish. Most of the game and nongame species are susceptible to most or all the effects described above, but some effects would impact only certain groups of game and nongame species.

Bats

Although the proposed exploration activities do not include impacts to caves, existing research on the vibration effects related to bat roosting and nesting are summarized below. Adams, Morrow, and Koebel (2018) conducted a study at Mammoth Cave National Park in Kentucky using five sources of vibrations (hammer drill, plate compactor, jackhammer, personnel simulating a bat survey near the hibernaculum, and ambient background levels) in other parts of the same cave system as a hibernation area, more than 300 ft away from the area. Vibration velocities ranged from 0.000062 ips (ambient vibration) to 0.000947 ips (plate compactor) and were at least 100 times less than values reported in the literature as potentially affecting hibernating bats.

Delaney (2002) cites studies suggesting vibration limits for construction vibrations around bat hibernacula, including 0.10 ips as a safe threshold to avoid disturbed hibernating bats and 0.02 ips as not detrimental to hibernating Indiana Bats.

Additionally, it has been noted that bats appear to habituate to noise, and vibrations as evidenced by the many bat species that use bridges as roosts during the reproductive season and occasionally during hibernation (Summers et al. 2023).

However, the data cited above were collected under specific conditions and should not be considered for broad application. Like sound, vibrations attenuate with distance. Attenuation rates differ depending on rock or soil type (Amick and Gendreau 2000, Fang et al. 2023) and are frequency-dependent, with higher frequencies attenuating more rapidly with distance (Amick and Gendreau 2000). Therefore, specifics of substrate type, frequencies of vibrations produced at the source, and distance from receptors, and any known sensitivity of receptors to vibrations, need to be considered in vibration effects analysis. In relation to vibrations caused by mineral exploration drilling, research is focused on ways to reduce vibrations, which affect breakage and wear of drill components and drilling efficiency (for examples, see Ghasemloonia, Rideout, and Butt 2015, Pashchenko et al. 2024, Riane et al. 2022).

Therefore, there is no determination of a distance from potential bat roosts that vibrations would be considered to not likely affect roosting bats. However, evidence from Adams, Morrow, and Koebel (2018) suggests that roosts as near as 300 ft from drill sites are well outside the range would be affected by project drilling vibrations. There is potential for California leaf-nosed bat, Pale Townsend's big-eared bat, and Myotis bat roosts within the project area, but there are no known locations. Any effects would be limited to the time that a drill pad was active, estimated to be approximately 1 week to 4 weeks, depending on the pad.

Bat species using echolocation may also have their ability to detect prey compromised by ultrasonic frequencies around active drill pads. With a 500-ft noise effect around active pads, approximately 26 ac would be affected at each pad, or approximately 52 ac if two pads were active. The effects would vary depending on the frequencies used by each species.

Small Mammals and Lizards

Small mammals, tortoises, and lizards, all of which are nongame species, could be affected by ground vibrations near the proposed drilling locations, causing loss of subsurface shelters and abandonment of the vicinity.

Aquatic Species

At least three and possibly four existing low water road crossings of Copper Creek on BLM lands would be used for the project (**Figure 4**). The crossing upstream from the dam may be avoided entirely. Project traffic at Copper Creek crossings may affect aquatic species, all of which are nongame. Bunker Hill Road would be used to access numerous pads south of Copper Creek and would not require crossing the creek. For pads accessed via Copper Creek Road, project-specific activities would require several project vehicle crossings of Copper Creek per day. Depending on the active pad locations, one, two, or all three Copper Creek crossings would be used in a day. Seven project pads would potentially be accessed using the crossing immediately below the dam, and alternative routes that would use the downstream crossings may be used for some of those pads. Regular crossings at the dam location would be expected to occur only when drill pads requiring the use of this crossing for access are active. This is estimated to include daily crossings for multiple vehicles for periods estimated at less than 1 week to 4 weeks with an average of 2 weeks for each hole at up to nine drill pads. Where access roads pass near the three identified project springs, no new surface disturbance is planned. Hendetta and Bootlegger springs are on the outer perimeter of the Project Area and travel past

those springs is expected to be only to the three pads that are accessed from the road that passes the springs. Hendetta Spring is mapped more than 350 ft from the existing road, outside of BLM land, and Bootlegger Spring is mapped more than 50 ft from the road (**Figure 4**). Neither spring is closer than 500 ft from the nearest pad. Traffic passing Number 19 Spring would be limited to when the one pad accessed by that road is active. Number 19 Spring is more than 400 ft from the nearest access road and more than 600 ft from the nearest pad.

Groundwater pumping for the project could reduce the availability of surface water, crucial for aquatic species and other wildlife as a drinking source. Additionally, it may deplete shallow groundwater levels, adversely affecting riparian vegetation and leading to habitat degradation.

Game Species

A potential impact limited to game species in the Project Area is the availability of the species for hunting. Effects that could lead to reduced hunting success include a decrease in game species numbers and temporary avoidance by game species of project activity areas where hunters previously had success hunting.

Species Impact Summary

Groundwater pumping can reduce surface water availability and lead to loss of available breeding habitat, drinking water, forage, cover, and to mortality or inability to successfully move through the area. Construction noise and nighttime lighting are expected to be ongoing at up to two pads at a time, 24 hours per day, 7 days per week, for up to 3 years, excluding periods of inclement weather and planned shutdowns. Proposed Action Alternative activities would cause an increase in ambient noise levels and nighttime lighting at up to two locations at a time within the Project Area for the duration of Proposed Action Alternative activities. Continuous construction noise can disrupt wildlife behavior including communications, mating calls, and predator and prey interactions. Nighttime lighting can disorient nocturnal species, disrupt natural behaviors, and increase predation risks. Project design features outlined in **Section 2.2.10** would reduce potential impacts from lighting, fugitive dust, and erosion, and on sedimentation in water resources, but may not eliminate them entirely. Noise would further be reduced by drilling at less than the maximum possible rate, to keep drill holes straight. No drilling would occur within 500 ft of the riparian areas from May 25 to September 30 (**Figure 5**), and a secondary muffler would be installed on drill rigs to reduce noise impacts.

Residual Impacts

Residual impacts after implementation of the design features in **Section 2.2.10** and reclamation would be the same as stated in the Species Impact Summary above.

3.4.1.4. CUMULATIVE IMPACTS

Past and Present Actions

The acreages of past and present actions and RFFAs in the 92,257-acre CESA (**Figure 6**) are listed in **Table 3-2**, as tallied from the BLM's Legacy Rehost System (LR2000) and Mineral &

Lands Record System (MLRS) (active and expired = past and present actions; pending = RFFAs), the BLM National Operations Center, the National Interagency Fire Center, and estimates from Google Earth aerial photography. Those past and present actions within the CESA total approximately 2,000 ac (2.17 percent of the CESA). This includes authorized and expired mineral exploration and mining notices of intent and plans of operation, and mineral material disposal sites, totaling 111 ac (0.12 percent of the CESA); agricultural lands covering 1,000 ac (1.1 percent of the CESA); miscellaneous structures and fields totaling 250 ac (0.27 percent of the CESA); fires since 2003 that have burned approximately 600 ac (0.65 percent) of the CESA, and 5 ac (<0.01 percent of the CESA) for reasonably foreseeable mining activities. Grazing allotments cover approximately 40,000 ac (43.4 percent) of the CESA.

Past and present actions that could have impacted and may be currently impacting game and nongame species habitat in the CESA include several activities. Mineral mining and exploration first started in the area in the early 1900s on private as well as State Trust and BLM lands. Mining and exploration activities included development of existing roads on approximately 5 ac of BLM lands, previous improvements for pads and roads on approximately 12 ac of BLM lands, and other surface disturbances visible on aerial photos that are likely associated with mining activities. Mining activity has also resulted in degradation of water quality. ADEQ lists Upper Copper Creek as impaired for copper, iron, selenium, cadmium, and zinc (ADEQ 2024). Currently, there are remedial projects including evaporation ponds and monitoring wells near and within the Project Area to address those historical impacts of mining. Historic land uses for agriculture, ranching, and residences (land clearing, planting, fertilizer and pesticide use, water infrastructure, stock tanks, pumping, cisterns, fencing, road infrastructure, maintenance, livestock, feeding and supplements, etc.) have occurred in the area since the 1800s and continue today. A common land use is recreation, including hunting, dispersed camping, OHV use, and travel through the CESA to U.S. Forest Service land, Arizona State Land, or private land. Wildfires have been part of the landscape in the past and will likely have impacts in the future.

These uses are likely having and likely have had effects on wildlife from road-based travel, noise, and dust. Dispersed recreation and exploration may disrupt wildlife and possibly damage vegetation (from cross-country OHV travel or pad clearing). The AGFD works to manage game species for healthy populations through the hunting tag program and considers nongame wildlife in hunting management. Wildfires damage existing wildlife habitat but enable recolonization by pioneer species and successional ecological communities.

Potential indirect impacts to game and nongame species habitat primarily would have resulted from surface disturbance associated with mineral mining and exploration, agriculture, ranching, and livestock grazing, infrastructure, dispersed recreation, and wildfires. Both game and nongame species may be negatively impacted by noise, nighttime lighting, and human presence, causing them to vacate the area while foraging. Nongame species, including bats, may be indirectly impacted by ultrasonic noise while foraging; reptiles, such as snakes and tortoises, as well as insects may be impacted by drilling vibrations; and there is potential for nighttime artificial lighting to impact species such as moths and bats, causing them to vacate the area. No drilling would occur within 500 ft of the riparian areas from May 25 to September 30 (**Figure 5**) and a secondary muffler would be installed on drill rigs to reduce noise impacts. Both game and

nongame species may be negatively impacted by reduction in available surface water supply and degraded habitat including loss of available breeding habitat, drinking water, forage, cover, and lead to mortality or inability to successfully move through the area. Disturbance to game and nongame species habitat from past and present actions within the CESA would have been reduced to some degree through reclamation and seeding of disturbed areas and natural recolonization of native species.

RFFAs

Potential impacts to habitat from mineral exploration, agriculture, livestock grazing, associated infrastructure, dispersed recreation, and wildfires are expected to continue. The SFO plans to designate a comprehensive network of motorized routes and trails for managing travel within this project vicinity that could affect impacts to the CESA.

Cumulative Impacts Analysis

Under the Proposed Action Alternative, in combination with other past, present, and RFFAs, game and nongame species may be negatively impacted by road-based travel, dust, day and nighttime noise levels, drilling vibrations, artificial lighting at night, and habitat degradation. Potential impacts due to reduced water resource availability for game species and nongame species may include loss of available drinking water, forage, cover, and game and nongame species of wildlife mortality or abandonment of the Upper Copper Creek area. Accordingly, the Proposed Action Alternative, in combination with other past, present, and RFFAs, may result in changes to population trends for game or non-games species.

3.4.1.5. PREFERRED ACTION ALTERNATIVE ENVIRONMENTAL CONSEQUENCES

The Preferred Action Alternative environmental consequences would be similar to those of the Proposed Action Alternative but would include an AMP. Differences in effects would be limited to riparian and aquatic resources and the habitats and communities dependent on surface and groundwater resources. Only those differences are discussed in this section.

Under the Preferred Action Alternative, there is a risk of riparian and aquatic resource loss that could affect the suitability of the habitat and availability of surface and groundwater resources for game and nongame species. This could lead to loss of available breeding habitat, drinking water, forage, cover, and to game species mortality or abandonment of the area inability to successfully move through the area. Additional discussion of the potential effects of groundwater pumping are discussed below in **Section 3.4.4**. The AMP outlined in **Section 2.3.1** would obligate Redhawk and the BLM to enhanced resource monitoring in order to mitigate probable groundwater drawdown effects from Preferred Action Alternative groundwater pumping.

Residual Impacts

Residual impacts after implementation of the AMP in addition to the design features in **Section 2.2.10** and reclamation would be the same as stated in the Game Species Summary and Nongame Species Impact Summary above.

3.4.1.6. CUMULATIVE IMPACTS

Past and Present Actions

Past and present actions are the same as for the Proposed Action Alternative.

RFFAs

RFFAs for the Preferred Action Alternative are the same as for the Proposed Action Alternative.

Cumulative Impacts Analysis

Under the Preferred Action Alternative, in combination with other past, present, and RFFAs, game and nongame species may be negatively impacted by road-based travel, dust, day and nighttime noise levels, drilling vibrations, artificial lighting at night, and habitat degradation. Potential impacts due to reduced water resource availability for game species and nongame species may include loss of available drinking water, forage, cover, and game and nongame species of wildlife mortality or abandonment of the Upper Copper Creek area.

The AMP outlined in **Section 2.3.1**, however, would obligate Redhawk and the BLM to enhanced resource monitoring to mitigate probable groundwater drawdown effects from Preferred Action Alternative groundwater pumping. The implementation of the AMP would provide decision-makers with methods and information to determine whether Preferred Action Alternative groundwater pumping is the cause of a specific water resource parameter falling below a threshold and triggered measures (specific reductions in groundwater use for project purposes for the Preferred Action Alternative) when the BLM determines that project groundwater pumping is the cause of a specific water resource parameter falling below the threshold. Because of the expected information associated with future implementation of the AMP under this alternative, it is expected that the cumulative impacts to game and nongame species would be lower than the cumulative impacts to game and nongame species under the Proposed Action Alternative over time.

3.4.2. ISSUE STATEMENT 2

2. Across each alternative, what is the potential for impacts to occur to BLM sensitive species as well as threatened and endangered species within the Project Area (habitat degradation and loss, loss of surface water, noise pollution, and introduction of invasive species or spread of existing invasive species)?

3.4.2.1. AFFECTED ENVIRONMENT

The environmental conditions of the affected environment are the same as described in **Section 3.4.1**, Issue Statement 1. Special-status Species, including BLM Sensitive species and those with Endangered Species Act (ESA) status, rely on the vegetation in the Project Area for forage, shelter, and nesting. The aquatic habitat also serves as a crucial drinking water source for these species and supports aquatic and semi-aquatic species. Riparian vegetation adjacent to these

aquatic resources offers additional forage, shelter, and nesting opportunities, attracting species that might otherwise be absent. These Special-status Species may also traverse the Project Area to access these vital resources.

A USFWS IPaC report (**Appendix E**) returned 10 ESA-listed species recommended for inclusion in an effects analysis for the Project Area: ocelot (*Felis pardalis*), Mexican spotted owl, yellow-billed cuckoo, cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), Chiricahua leopard frog (*Rana chiricahuensis*), Gila chub, Gila topminnow, loach minnow, spikedace, and Huachuca water-umbel. The IPaC also lists one Proposed Threatened species, the monarch butterfly (*Danaus plexippus*). There are no AGFD ERT records of occurrence of these species within 3 miles of the Project Area (**Appendix C**). There is no proposed or designated critical habitat within the Project Area (**Appendix E**).

WestLand determined that the potential to occur of 9 of the 10 listed species within the Project Area is **None** (**Appendix D**). The Threatened yellow-billed cuckoo and Proposed Threatened monarch butterfly were determined to have a potential to occur of **Possible**. The yellow-billed cuckoo and monarch butterfly are discussed in greater detail.

The AGFD ERT (**Appendix C**) indicates that AGFD models predict the ranges of 20[11] BLM Sensitive fish and wildlife species intersect the Project Area. Of the species considered, the lowland leopard frog is the only one with an AGFD ERT record indicating its presence within 3 miles of the Project Area (**Appendix C**). Additionally, AGFD has also informed the BLM of records for the Sonoran desert tortoise occurring within the same proximity to the Project Area. WestLand conducted an evaluation of the potential for these species to occur within the Project Area (**Appendix D**). The criteria used to determine the potential of occurrence for each species are defined as follows:

> **Present:** The species has been observed to occur within the Project Area, the Project Area is within the known range and distribution of the species, and habitat characteristics required by the species are present.
>
> **Possible:** There are no known records of the species within the Project Area, but the known, current distribution of the species includes the Project Area and the required habitat characteristics of the species appear to be present in the Project Area. Given the uncertainty associated with species identification and accuracy of the location of observations from eBird and other citizen science databases, observations associated with citizen science databases are evidence that a species is possible within the Project Area.
>
> **Unlikely:** The known, current distribution of the species does not include the Project Area, but the distribution of the species is close enough such that the Project Area may be within the dispersal or foraging distance of the species, and they may show up as transients; especially applicable to species that can fly. The habitat characteristics required by the species may be present in the Project Area.

[11] This excludes any BLM-sensitive species that have ESA status, which are discussed separately.

None: The Project Area is outside of the known distribution of the species, or the habitat characteristics required by the species are not present.

The following determinations of potential to occur within the Project Area were made for these species:

- Present
  - Lowland leopard frog
  - Sonora mud turtle
  - Townsend's big-eared bat (*Corynorhinus townsendii*)
- Possible:
  - American peregrine falcon (*Falco peregrinus anatum*): foraging, **None** for nesting; nesting typically occurs within cliffs (AGFD 2022), which are not present in the project area.
  - California leaf-nosed bat (*Macrotus californicus*)
  - Cave myotis (*Myotis velifer*)
  - Ferruginous hawk (*Buteo regalis*): winter, **None** for nesting; the Project Area is outside the known breeding range for the species (Corman and Wise-Gervais 2005).
  - Golden eagle (*Aquila chrysaetos*): foraging, **Unlikely** for nesting; nesting typically occurs within cliffs but can include rock outcrops, tall trees (especially ponderosa pine), juniper, or rarely transmission towers (Driscoll 2005). Nests are reused and can reach 12 ft across and 5 ft deep, requiring suitable support platforms (Driscoll 2005), which are not present in the Project Area; species is also covered under the Bald and Golden Eagle Protection Act
  - Greater western mastiff bat (*Eumops perotis californicus*)
  - Lesser long-nosed bat (*Leptonycteris yerbabuenae*)
  - Sonoran desert tortoise (*Gopherus morafkai*)
  - Desert purple martin (*Progne subis hesperia*)
  - Gilded flicker (*Colaptes chrysoides*)
  - Yellow-billed cuckoo
  - Monarch butterfly
- Unlikely:
  - Mexican long-tongued bat (*Choeronycteris mexicana*)
  - Arizona Botteri's sparrow (*Peucaea botterii arizonae*)
- None:
  - Black-tailed prairie dog (*Cynomys ludovicianus*)
  - Desert sucker (*Catostomus clarkii*)
  - Longfin dace (*Agosia chrysogaster*)
  - Northern goshawk (*Accipiter gentilis*)
  - Sonora sucker (*Catostomus insignis*)

- Ocelot (*Leopardus pardalis*)
- Cactus ferruginous pygmy owl (*Glaucidium brasilianum cactorum*)
- Chiricahua leopard frog (*Lithobates chiricahuensis*)
- Gila chub
- Gila topminnow
- Spikedace
- Loach minnow
- Bald eagle (*Haliaeetus leucocephalus*)
- Mexican spotted owl
- Huachuca water umbel

A Candidate Conservation Agreement (CCA) has been implemented for the Sonoran desert tortoise (USFWS and Arizona Interagency Desert Tortoise Team 2015). Species with a CCA do not have ESA protection and are not Candidates for ESA listing but the CCAs include conservation measures that each signatory has committed to following. CCAs factor in the decisions that the species covered under the CCA do not warrant listing under the ESA. The BLM is signatory to the Sonoran desert tortoise CCA.

WestLand confirmed the presence of lowland leopard frogs in the 0.5-mile wetted reach of Copper Creek immediately downstream from the dam during a site visit on October 27, 2022, but no lowland leopard frogs were found on that date between Saloon Canyon and the constricted portion of the creek (**Figure 4**). Lowland leopard frogs were also documented in 2005, 2008, 2023, and 2024 by BLM staff.

During field investigations that included the Project Area in July and August 2012, WestLand also confirmed the presence of Sonora mud turtles in Copper Creek and found potential California leaf-nosed bat sign and myotis bats of unknown species (WestLand 2012).

Surveys for two BLM Sensitive plant species, Aravaipa sage and big sedge, conducted on the wetted portions of Copper Creek between the dam and the constricted part of the creek by WestLand under direction from the BLM on October 27, 2022, resulted in no detections of the species. In addition, the Bootlegger Spring area has the potential to provide suitable habitat for the lowland leopard frog and Sonora mud turtle on a temporary basis.

3.4.2.2. NO ACTION ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, impacts to BLM Sensitive species and ESA species would be consistent with current land use, including recreation, camping, driving motorized all-terrain vehicles, grazing, as well as minimal mineral exploration, which would be expected to continue at similar levels to current use in the Project Area.

3.4.2.3. PROPOSED ACTION ALTERNATIVE ENVIRONMENTAL CONSEQUENCES

The Proposed Action may directly affect BLM Sensitive and ESA species within the vicinity of active drill pads and during road widening activities. There is a potential risk of harassment, injury, and mortality of individual wildlife. Direct impacts to individual BLM Sensitive and ESA

species would result from ground disturbance or collisions with and crushing by vehicles. Potential sources of indirect effects are habitat degradation and disturbance through human presence, approximately 18 ac of ground disturbance and introduction of invasive species or spread of existing invasive plant species, noise and vibrations, nighttime lighting, fugitive dust, resulting from traffic, road improvements, drill site operations, and remediation activities. The resulting indirect effects could include decreases in foraging success, access to shelter and surface water, avoidance of predators, detection of prey, and breeding and other behaviors of BLM Sensitive and ESA species, including life functions of aquatic species. BLM Sensitive and ESA species would temporarily vacate or avoid those portions of the Project Area where surface disturbing and/or drilling activities are occurring.

Each of the above potential direct and indirect impacts are described in detail in **Section 3.4.1.3**. These direct and indirect impacts would potentially affect ESA and BLM Sensitive species in the same ways as the game and nongame species. Effects on specific species and groups of species are discussed below.

Yellow-billed Cuckoo

Yellow-billed cuckoo could potentially be affected by the proposed project. If present, noise from drilling could affect yellow-billed cuckoos around the riparian areas of Copper Creek, and a lowered groundwater table caused by project groundwater pumping could affect riparian vegetation and suitability for yellow-billed cuckoo nesting, foraging, and dispersing.

The largest riparian vegetation patch on Upper Copper Creek between the dam area and the constricted area of Copper Creek (**Figure 4**) that could potentially support species suitable for yellow-billed cuckoo habitat is 1.3 ha in size. All these patches are in part or completely outside of the Project Area, but the entire reach from the dam to the constricted area of the creek is considered in this evaluation to provide a conservative analysis. Yellow-billed cuckoo has been observed nesting outside of areas dominated by typical riparian tree species, such as in Madrean evergreen woodland oak trees often with mesquite trees flanking the riparian strip (USFWS 2021)In the Project Area, riparian vegetation transitions to the surrounding upland vegetation that has limited overstory and may be unsuitable nesting habitat for yellow-billed cuckoo.

In California, researchers delineated four factors associated with yellow-billed cuckoo nesting habitat based on detections that include (Wiggins 2005):

1. Riparian forest with a minimum size of 15 hectares (ha; 37 ac)[12]
2. A minimum of 3 ha (7.4 ac) of closed canopy
3. Canopy height of between 5 and 30 meters (m; 16.4 and 98.4 ft)
4. Vegetation understory with an average height of 1 to 6 m (3.3 and 19.7 ft)

Additionally, a study of 414 occupied, yellow-billed cuckoo habitat patches found that the smallest occupied patch was 1.6 ha (4.0 ac) and no breeding yellow-billed cuckoo were detected

[12] Literature cited throughout this section uses "hectares" and “meters” as the primary unit of measure (i.e., 1 hectare = 2.471 ac) and is reflected throughout **Section 3.4.1**.

in patches smaller than 2 ha (4.9 ac) (McNeil et al. 2013). Other studies cite riparian patches less than 15 ha (37 ac) on the Colorado River in Arizona and California as unsuitable for nesting. Additionally, home ranges on the San Pedro River ranged from 38.6 ha (95 ac) (with size varying from 1 to 225 ha or 2.5 to 556 ac, possibly indicating differences in habitat area, quality, or prey densities (USFWS 2021). Known nesting habitat for the species occurs on the San Pedro River near its confluence with Copper Creek, approximately 8-miles west of the Project Area. The confluence is within designated Critical Habitat Unit AZ-15 for the species and includes 119 miles of the Lower San Pedro River, covering 9,470 ha (23,400 ac) (USFWS 2021).

Yellow-billed cuckoos were found to have a maximum territory size of 40 ha (100 ac) in California (Wiggins 2005), while in New Mexico, yellow-billed cuckoos were documented foraging up to 0.5 mile from their nest site (USFWS 2021). These studies suggest that the 8-mile distance to the Project Area is farther than a nesting cuckoo would travel to forage, especially with more abundant resources available along the San Pedro River. Breeding or migratory birds could potentially find and use the small riparian patches in the Project Area, but the presence of the large area of suitable breeding and foraging habitat within the Critical Habitat on the San Pedro River, combined with the undersized patches of riparian habitat within the Project Area, make it unlikely that any individuals would occur within the Project Area on more than a transient basis, while passing through.

The AGFD ERT screening produced no yellow-billed cuckoo records within 3 miles of the Project Area. Although the habitat patches are small, suitable nesting and foraging habitat may exist. The riparian corridor may also be used by transients during migration or dispersal.

A lowered groundwater table could affect riparian vegetation and suitability for yellow-billed cuckoo if they use the proposed project area for nesting, foraging, and dispersal. Effects from the Proposed Action Alternative on riparian habitat includes the following:

- **Vegetation Removal**: **Figure 5** depicts riparian vegetation as well as a 500 ft buffer along Upper Copper Creek and Copper Creek Road in the project area. There is no surface disturbance related to the drill pads and roads within the riparian vegetation area; no riparian vegetation would be removed as part of exploration activities. No additional surface riparian vegetation would be removed as part of the Proposed and Preferred Alternatives. However, groundwater pumping could result in the loss of riparian vegetation along Copper Creek.

- **Noise Effects**: The noise effects from the nearest drill pad to riparian vegetation (located 500 ft away) are expected to attenuate to no more than 57.2 dBA at the edge of the vegetation (WestLand 2024, WKC Group 2024; accessed May 1, 2024)below the 69 dBA threshold recommended by the USFWS for noise reduction measures to protect the federally Threatened Mexican spotted owl (USFWS 2012). Further, a study by Dillon and Moore (2020) found no significant difference in flushing rates from nests for four species of riparian obligate birds exposed to construction noise compared to control birds of the same species not subjected to such noise. The construction noise in that study was broadcast at 85 dBA, which is lower than the assumed maximum noise from the Proposed Action pads (86.3 dBA) at distances ranging from 164 to 1,312 ft from the nests.

- **Lighting Effects:** While yellow-billed cuckoo forage during the daytime, design features for nighttime lighting at the drilling locations will attenuate lighting effects by more than 99 percent within a distance of less than 90 ft from the lighting sources. This attenuation ensures that the riparian habitat remains minimally affected by artificial lighting.

Monarch Butterfly

Neither species-specific monarch nor milkweed surveys were conducted within the Project Area. Milkweed and foraging habitat are likely present within the Project Area. Additionally, monarchs have been recorded approximately 7-miles southwest of the Project Area and milkweed has been documented approximately 0.5 mile north of the Project Area (The Xerces Society for Invertebrate Conservation 2023). Therefore, this species has a potential to occur within the project area. Ground disturbance although limited and almost exclusively in previously disturbed areas within the Project Area, may result in individual Monarch butterflies being injured or killed and individual milkweed plants and foraging plants damaged or killed.

Raptors

Special-status species raptors would only be present in the Project Area for foraging. As noted in **Section 3.4.2.1** and **Appendix D**, there are no suitable nesting sites within the Project Area for the peregrine falcon, it is unlikely that there are any suitable nesting sites for the golden eagle and the Project Area is outside the known breeding range of the ferruginous hawk. Foraging resources (prey) would be affected at active pad sites and within the 18 ac of disturbance areas until the areas had recovered from the disturbance. Design features and BMPs for disturbance and vegetation described in **Section 2.2.10** were included to reduce these impacts.

Other Birds

Other Special-status Species of birds could avoid nesting in the areas surrounding active drill pads and lose nesting and roosting opportunities within the 18 ac of disturbance areas until vegetation had recovered from the disturbance. They may also avoid nesting and foraging around drill pads due to noise disturbance and noise may interfere with communication around active drill pads. A 500-ft noise effect around active drill pads would include approximately 26 ac at an active pad, or 52 ac if two pads were active. Displacement may temporarily cause greater competition for resources in other areas. Design features and BMPs for disturbance, vegetation, and noise described in **Section 2.2.10** were included to reduce these impacts.

Bats

Special-status Species of bats could be affected by nighttime lighting and noise and vibrations from drilling operations, affecting their foraging success, ability to navigate, and communication in the areas affected. In this case, the species would temporarily disperse from the area to forage and find shelter. Changes to the vegetation and increase of dust may affect the availability of insects and other small prey that small mammals feed on. Lighting could attract or repel bat prey. A 500-ft noise effect around active drill pads would include approximately 26 ac at an active pad, or 52 ac if two pads were active. Echolocation using ultrasonic frequencies would be

affected for a shorter distance than hearing reliance on lower sound frequencies, due to the higher attenuation rate of higher frequencies. Vibrations from drilling could potentially affect bat roosts. Design features and BMPs for disturbance, vegetation, and noise described in **Section 2.2.10** were included to reduce these impacts.

Riparian-Dependent

Special-status Species of riparian-dependent wildlife include the lowland leopard frog and Sonora (or desert) mud turtle. Lowland leopard frogs breed primarily from January to May and, in some populations, secondarily after the onset of the summer rains (AGFD 2023). The Sonora mud turtle is active year-round but less active December through February and inactive during the winter months at higher elevations (Rorabaugh 2019). Loss of surface water due to the project pumping could affect the life cycle of these species, and sedimentation could affect water quality for these species. Lowland leopard frog eggs may be smothered, and sedimentation may affect tadpoles if their grazing areas become covered with sediment. Vehicles crossing Copper Creek when water is present could crush individuals or eggs. Although adults of both species use upland areas, it is unlikely that either species would be found on Proposed Action drill pads even absent project implementation. Design features and BMPs described in **Section 2.2.10** were included to reduce impacts to aquatic species.

Noise, vibrations, nighttime lighting, and fugitive dust, resulting from traffic, road improvements, drill site operations, and reclamation activities could cause the lowland leopard frog and Sonora mud turtle to temporarily avoid those portions of the Project Area where surface disturbing and/or drilling activities are occurring; however, the potential for those impacts is low. Approximately 0.8 acre of existing roadbed through riparian areas would be directly impacted by project activities. These species have a low potential both spatially and temporally for occurring in the upland areas where surface disturbing activities would occur.

If changes in surface water were to occur, there would be impacts to their shelter, foraging and reproduction. Changes in habitat may increase their exposure to predations.

Sonoran Desert Tortoise

The Sonoran desert tortoise has the potential to occur within the project area. WestLand has observed Sonoran desert tortoises on the lower slopes of the Galiuro Mountains, approximately 5 to 6 miles southwest of the Project Area. Additionally, AGFD has reported records of Sonoran desert tortoises within 3-miles of the Project Area. The AGFD considers the Project Area to be occupied by Sonoran desert tortoises with the uppermost reaches of the project site having marginal habitat for the species. This species has the potential to occur of **Possible**.

Sonoran desert tortoises in the Project Area could be directly impacted by vehicle collisions, shelters could be destroyed during pad preparations, and potential forage within the disturbance areas would be lost until vegetation had recovered from the disturbance. Additionally, the use of water trucks for dust control on roads may prompt tortoises to leave their shelters due to the scent of water and damp soil, which could be perceived by them as a drinking opportunity (AGFD pers. comm. to BLM and WestLand, April 18, 2024). Design features and BMPs for

disturbance, vegetation, and vehicle or equipment collisions described in **Section 2.2.10** were included to reduce these impacts. These measures include a WEAP that would have specific information for the species. The WEAP would be presented to Redhawk by a qualified biologist and all onsite workers would be required to complete the WEAP training prior to onsite work. A 10-mph speed limit would be enforced on site and if a Sonoran desert tortoise is observed in the Project Area, the Sonoran desert tortoise would be moved by someone with a permit issued by the AGFD per their guidance (AGFD 2014). Other design features and BMPs developed that a relevant to reduce potential impacts to Sonoran desert tortoises include construction of all sumps and other small excavations with a sloped end for egress to preclude access and backfilling or covering after completion of drilling activities; prohibiting harassment of wildlife; requiring all vehicle operators to inspect the work area and beneath all vehicles and equipment for wildlife prior to starting and moving equipment; and adjusting any new disturbance to avoid impacts to sensitive biological resources.

No impacts likely to lead to a loss of viability or result in a trend toward federal listing are anticipated for any BLM Sensitive species. The information is summarized for all these species in further detail in **Appendix D**.

Species Impact Summary

Impacts to ESA and BLM Sensitive species may cause loss of ability to forage, reproduce, or find shelter that would lead to decreased population stability in some species. Design features outlined in **Section 2.2.10** can reduce impacts from surface disturbance, lighting, noise and vibrations, fugitive dust, erosion, and sedimentation to water resources in the Project Area, but may not eliminate them entirely.

Residual Impacts

Residual impacts after implementation of the design features in **Section 2.2.10** and reclamation would be the same as stated in the Species Impact Summary above.

3.4.2.4. CUMULATIVE IMPACTS

Past and Present Actions

The acreages of past and present actions and RFFAs in the 92,257-acre CESA (**Figure 6**) are listed in **Table 3-2**, as tallied from the BLM's MLRS (active and expired = past and present actions; pending = RFFAs), the BLM National Operations Center, the National Interagency Fire Center, and estimates from Google Earth aerial photography. Those past and present actions within the CESA total approximately 2,000 ac (2.17 percent of the CESA). This includes authorized and expired mineral exploration and mining notices of intent and plans of operation, and mineral material disposal sites, totaling 111 ac (0.12 percent of the CESA); agricultural lands covering 1,000 ac (1.08 percent of the CESA); miscellaneous structures and fields totaling 250 ac (0.27 percent of the CESA); fires since 2003 that have burned approximately 600 ac (0.65 percent) of the CESA; and 5 ac (<0.01 percent of the CESA) for reasonably foreseeable mining activities. Grazing allotments cover approximately 40,000 ac (43.36 percent) of the CESA.

Past and present actions that could have impacted and may be currently impacting BLM Sensitive species and ESA species and their habitat in the CESA include several activities. Mineral mining and exploration first started in the area in the early 1900s on private as well as State Trust and BLM lands, which depending on the species could include physical, noise, and light impacts to individuals and their habitat. Those activities include existing road improvements on approximately 5 ac of BLM lands, previous improvements for pads and roads on approximately 12 ac of BLM lands, and additional acres of miscellaneous disturbance visible on aerial photos that are likely associated with mining activities. Mining activity has also resulted in degradation of water quality. ADEQ lists Upper Copper Creek as impaired for copper, iron, selenium, cadmium, and zinc (ADEQ 2024). Currently, there are remedial projects including evaporation ponds and monitoring wells near and within the Project Area to address those historical impacts of mining. Historic land uses for agriculture, ranching, and residences (land clearing, planting, fertilizer and pesticide use, water infrastructure, stock tanks, pumping, cisterns, fencing, road infrastructure, maintenance, livestock, feeding and supplements, etc.) have occurred in the area since the 1800s and continue today. A common land use is recreation including hunting, dispersed camping, OHV use, and travel through the CESA to U.S. Forest Service land, Arizona State Land, and private land. Wildfires have been part of the landscape in the past and will likely have impacts in the future.

Potential indirect impacts to BLM Sensitive species habitat in the CESA primarily would have resulted from surface disturbance and degraded water quality associated with mineral mining and exploration, agriculture, ranching, and livestock grazing, infrastructure, dispersed recreation, and wildfires. Disturbance to BLM Sensitive species habitat from past and present actions within the CESA would have been reduced to some extent through reclamation and seeding of disturbed areas and natural recolonization of native species.

RFFAs

Potential impacts to BLM Sensitive and threatened and endangered species from mineral exploration, agriculture, livestock grazing, associated infrastructure, dispersed recreation, and wildfires are expected to continue. The SFO plans to designate a comprehensive network of motorized routes and trails for managing travel within this project vicinity that could affect impacts to the CESA.

Cumulative Impacts Analysis

The Proposed Action Alternative, in combination with other past, present, and RFFAs, may cause BLM sensitive species and ESA species to be negatively impacted by road-based travel, dust, day and nighttime noise levels, drilling vibrations, artificial lighting at night, and habitat degradation. Potential impacts due to reduced water resource availability may reduce aquatic resource availability for species that rely on water resources associated with Upper Copper Creek, leading to loss of breeding habitat, drinking water, forage, cover, and mortality or abandonment of the Upper Copper Creek area. Accordingly, the Proposed Action Alternative, in combination with other past, present, and RFFAs, is expected to result in changes to population trends for BLM-sensitive or threatened and endangered species.

3.4.2.5. PREFERRED ACTION ALTERNATIVE ENVIRONMENTAL CONSEQUENCES

The Preferred Action Alternative environmental consequences would be similar to those of the Proposed Action Alternative but would include an AMP and associated monitoring. Differences in effects would be limited to aquatic resources and the plants and wildlife dependent on those resources. Only those differences are discussed in this section.

Species Impact Summary

Under the Preferred Action Alternative, there is a risk of riparian and aquatic resource loss that could affect the suitability of the habitat for the federally threatened yellow-billed cuckoo and BLM Sensitive species reliant on these resources, specifically the lowland leopard frog and Sonora mud turtle. This could lead to degradation and loss of available breeding habitat, drinking water, forage, cover, and mortality or abandonment of the area for these species. The AMP outlined in **Section 2.3.1** would obligate Redhawk and the BLM to enhanced resource monitoring to mitigate probable groundwater drawdown effects from Preferred Action Alternative groundwater pumping.

Residual Impacts

Residual impacts after implementation of the design features in **Section 2.2.10** and reclamation would be the same as stated in the Species Impact Summary above.

3.4.2.6. CUMULATIVE IMPACTS

Past and Present Actions:

Past and present actions are the same as for the Proposed Action Alternative.

RFFAs

RFFAs for the Preferred Action Alternative are the same as for the Proposed Action Alternative.

Cumulative Impacts Analysis

The Preferred Action Alternative, in combination with other past, present, and RFFAs, may reduce aquatic resource availability for BLM Sensitive species that rely on water resources associated with Upper Copper Creek, leading to loss of breeding habitat, drinking water, forage, cover, and mortality or abandonment of the Upper Copper Creek area. The AMP outlined in **Section 2.3.1**, however, would obligate Redhawk and the BLM to enhanced resource monitoring to mitigate probable groundwater drawdown effects from Preferred Action Alternative groundwater pumping. The implementation of the AMP would provide decision-makers with methods and information to determine whether Preferred Action Alternative groundwater pumping is the cause of a specific water resource parameter falling below a threshold and triggered measures (specific reductions in groundwater use for project purposes for the Preferred Action Alternative) when the BLM determines that project groundwater pumping is the cause of a specific water resource parameter falling below the threshold. Because of the expected

information associated with future implementation of the AMP under this alternative, it is expected that the cumulative impacts to BLM Sensitive species, including threatened and endangered species, would be lower than the cumulative impacts to these species under the Proposed Action Alternative over time.

3.4.3. ISSUE STATEMENT 3

3. The Project Area is within a wildlife connectivity area identified by the Arizona Game and Fish Department; how would each alternative impact wildlife connectivity and movements?

3.4.3.1. AFFECTED ENVIRONMENT

The AGFD ERT report (**Appendix C**) cites the Santa Catalina/Rincon – Galiuro Connectivity Assessment as including portions of the Project Area. The Santa Catalina/Rincon – Galiuro Linkage Design was the result of modeling the biologically best corridors connecting the Santa Catalina and Rincon Mountains to the Galiuro Mountains (the three Wildland Blocks) for 18 focal species. The Connectivity Assessment identifies numerous potential corridors connecting the Wildland Blocks. The northernmost of the corridors follows Copper Creek from the San Pedro River over the Galiuro Mountain divide to the east slope of the mountains (**Figure 6**); herein referred to as the Copper Creek Corridor [CCC]). The corridor ends at Fourmile Canyon on the east, which connects to the Aravaipa Canyon Wilderness. The CCC is approximately 1 mile wide and centered on Copper Creek as it passes through the Project Area, extending down to the San Pedro River on the west. The environmental conditions of the affected environment are essentially the same as described in **Section 3.4.1**, Issue Statement 1, except that the Project Area includes some lands outside the CCC. The CCC is centered on Upper Copper Creek, a known water resource, as discussed in **Section 3.4.1**. Numerous springs are located within the CCC (Springs Stewardship Institute 2023; BLM pers. comm. to WestLand), including the three springs of BLM interest in relation to the project: Hendetta Spring, Bootlegger Spring, and Number 19 Spring (**Figure 4; Section 3.4.1**).

The CCC has been modeled as the biologically best corridor for 3 of the 18 focal species in the report: the giant spotted whiptail (*Aspidoscelis burti stictogrammus*), Sonoran desert toad (*Incilius alvarius*), and Sonoran desert tortoise (AGFD 2012). Three other species, badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), and lowland leopard frog, did not have modeled biologically best corridors mapped, the first two species due to their corridor lengths and presence of suitable habitat elsewhere throughout the linkage design, and the lowland leopard frog due to it mostly occurring in the lands between the Wildland Blocks and not in the Wildland Blocks themselves (AGFD 2012). The other 12 species had modeled biologically best corridors that did not include the CCC (AGFD 2012).

CCC species use vegetation in the Project Area for forage, shelter, and nesting. The aquatic habitat is additionally a source of drinking water for CCC species and provides resources for the aquatic lifecycle of species for which the aquatic regime of Copper Creek is appropriate. Riparian vegetation associated with the aquatic resources provides forage, shelter, and nesting

opportunities for CCC species that may otherwise be absent from the area. CCC species may traverse through the Project Area to access resources.

3.4.3.2. NO ACTION ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, impacts to the Santa Catalina/Rincon – Galiuro Linkage would be consistent with current land usage in the Project Area and within the CESA (mineral exploration, agriculture, ranching, recreation, driving, road improvements, grazing, commercial and residential private land activities, highway commercial and public traffic).

3.4.3.3. PROPOSED ACTION ENVIRONMENTAL CONSEQUENCES

The Proposed Action Alternative may affect habitat connectivity and movement of species, including the giant spotted whiptail, Sonoran desert toad, and Sonoran desert tortoise, for which the AGFD model identifies the CCC as the biologically best corridor connecting the Santa Catalina and Rincon mountains to the Galiuro Mountains. The effects would be within the localized area of daily activities and the traffic associated with the Proposed Action. The three species all have modeled predicted ranges that intersect with the Project Area and have potential to use the area as a habitat connectivity corridor, although the AGFD ERT has no records of occurrence of the species within 3 miles of the Project Area (**Appendix C**). WestLand has observed Sonoran desert tortoise on the lower slopes of the Galiuro Mountains an estimated 5 to 6 miles southwest of the Project Area and AGFD has reported to the BLM that they are aware of records of Sonoran desert tortoise within 3-miles of the Project Area.

Proposed Action direct disturbance would be limited to approximately 18 ac of roads and pads, previously disturbed except where expansion of pads and roads would occur. The pads and most roads directly leading to the pads, where not currently in use by recreational vehicles, would be cleared of recolonized vegetation, mainly grasses and forbs, and may have minor[13] expansion onto previously undisturbed lands to accommodate transporting vehicles, personnel and equipment including drill rigs that require roads with 12-ft width.

Human presence, noise, vibrations, ground disturbances, nighttime lighting, and fugitive dust resulting from traffic, road improvements, drill site operations, and remediation activities would cause wildlife to vacate from or temporarily avoid the CCC in the vicinity of the Project Area during Proposed Action Alternative activities. These effects are expected to extend no further than 500 ft from active pads and 50 ft from roads when project vehicles drive through (see **Section 3.4.1.2**). There would be no more than two active drill pads at any time, so wildlife avoidance would be expected to be no more than an area of approximately 1,070 ft by 1,070 ft (approximately 26 ac) at each active pad (pad plus 500-ft buffer) for a maximum approximate area of 52 ac during project activities. In the case that the 500-ft buffers of two active pads overlap, the corridor could be constricted by as much as 2,140 ft. Corridor constriction could

[13] Minor maintenance or improvement to allow adequate access for drill rigs. Minor maintenance includes blading the road for safety and improvement, where necessary, includes widening to 12 feet. Maintenance and improvement would include installation and maintenance of sediment control structures during all phases of the Preferred Action Alternative.

change wildlife movement patterns and interactions. There may be an increased exposure to predators using the corridor and resources within the avoided areas would not be available.

Groundwater pumping for the Proposed Action Alternative has the potential to affect the availability of surface water for wildlife using the CCC for connectivity and movements, and on shallow groundwater availability for riparian vegetation that provides invaluable habitat for those species.

Impacts to wildlife connectivity and movements within the CCC would be 24 hours per day for up to 3 years, with breaks during inclement weather and planned shutdowns. The design features and BMPs in **Section 2.2.10** would help to minimize impacts to wildlife connectivity and movements and to resource availability within the CCC.

Wildlife Connectivity Impact Summary

Impacts to wildlife connectivity and movements within the CCC may cause changed use of the CCC that would lead to decreased population stability. In the case of two overlapping pads being drilled at the same time, there would be a constriction of the corridor which may temporarily impede wildlife movement in this area, this may cause changes in movement and wildlife interactions. Changes in wildlife movement thus means changes in corridor use. Design features and BMPs outlined in **Section 2.2.10** would help to minimize impacts to wildlife connectivity and movements and to resource availability within the CCC. Measures to minimize impacts include avoiding any riparian vegetation clearing; avoiding vegetation clearing, drilling or reclamation within 500 ft of the centerline of Copper Creek riparian areas yellow-billed cuckoo breeding season; installing a secondary muffler on drill rigs to reduce noise impacts; and minimizing light pollution at night by hooding and shielding lights, directing lights down toward the interior of the drill pads at night, and locating lights to reduce their visibility as viewed from a distance.

Residual Impacts

Residual impacts after implementation of the design features in **Section 2.2.10** and reclamation would be the same as stated in the Wildlife Connectivity Impact Summary above.

3.4.3.4. CUMULATIVE IMPACTS

Past and Present Actions

The acreages of past and present actions and RFFAs in the 92,257-acre CESA (**Figure 6**) are listed in **Table 3-2**, as tallied from the BLM's MLRS (active and expired = past and present actions; pending = RFFAs), the BLM National Operations Center, the National Interagency Fire Center, and estimates from Google Earth aerial photography. Those past and present actions within the CESA total approximately 2,000 ac (2.17 percent of the CESA). This includes authorized and expired mineral exploration and mining notices of intent and plans of operation, and mineral material disposal sites, totaling 115 ac (0.12 percent of the CESA); agricultural lands covering 1,000 ac (1.1 percent of the CESA); miscellaneous structures and fields totaling 250 ac (0.27 percent of the CESA); fires since 2003 that have burned approximately 600 ac (0.65

percent) of the CESA, and 5 ac (<0.01 percent of the CESA) for reasonably foreseeable mining activities. Grazing allotments cover approximately 40,000 ac (43.4 percent) of the CESA.

Past and present actions that could have impacted and may be currently impacting wildlife connectivity and movements within the CCC in the CESA include mineral mining and exploration that first started in the area in the early 1900s on private as well as State Trust and BLM lands. Those activities include existing roads on approximately 5 ac of BLM lands, previous improvements for pads and roads on approximately 12 ac of BLM lands, and additional acres of miscellaneous disturbance visible on aerial photos that are likely associated with mining activities. Mining activity has also resulted in degradation of water quality. ADEQ lists Upper Copper Creek as impaired for copper, iron, selenium, cadmium, and zinc (ADEQ 2024). Currently, there are remedial projects including evaporation ponds and monitoring wells near and within the Project Area to address those historical impacts of mining. Historic land uses for agriculture, ranching, and residences (land clearing, planting, fertilizer and pesticide use, water infrastructure, stock tanks, pumping, cisterns, fencing, road infrastructure, maintenance, livestock, feeding and supplements, etc.) have occurred in the area since the 1800s and continue today. A common land use is recreation including hunting, dispersed camping, OHV use, and travel through the CESA to U.S. Forest Service lands, Arizona State lands, and private lands. Wildfires have been part of the landscape in the past and will likely have impacts in the future.

These uses are likely having and have had effects on wildlife connectivity and movements within the CCC from road-based travel, noise, and dust while dispersed recreation and exploration may disrupt wildlife and damage vegetation (from cross-country OHV travel or pad clearing). The AGFD works to manage game species for healthy populations through the hunting tag program and considers nongame wildlife in hunting management. Wildfires damage existing wildlife habitat but enable recolonization by pioneer species and successional ecological communities.

Potential indirect impacts to wildlife connectivity and movements within the CCC in the CESA primarily would have resulted from surface disturbance associated with mineral mining and exploration, agriculture, ranching, and livestock grazing, infrastructure, dispersed recreation, and wildfires. Disturbance to wildlife connectivity and movements within the CCC from past and present actions within the CESA would have been reduced to some extent through reclamation and seeding of disturbed areas and natural recolonization of native species.

RFFAs

Potential impacts to wildlife connectivity and movements within the CCC from mineral exploration, agriculture, livestock grazing, associated infrastructure, dispersed recreation, and wildfires are expected to continue. The SFO plans to designate a comprehensive network of motorized routes and trails for managing travel within this project vicinity that could affect impacts to the CESA.

Cumulative Impacts Analysis

The Proposed Action Alternative, in combination with other past, present, and RFFAs, may reduce upland, riparian, and aquatic resource availability for species using the CCC for

connectivity and movement that are reliant on these resources. These species are most notably the giant spotted whiptail, Sonoran desert toad, and Sonoran desert tortoise, for which the AGFD model identified the CCC as the biologically best corridor for connectivity and movements. Loss of breeding habitat, drinking water, forage, cover, and mortality or inability to successfully move through the area could result from implementation of the Proposed Action Alternative.

As discussed in **Section 3.4.3.3**, a maximum of 52 ac of the corridor could be directly impacted at a given time as a result of implementation of the Proposed and Preferred Action Alternative activities. Cumulatively, a maximum of up to approximately 406 ac of the corridor (500 ft around each pad and 50 ft of proposed roads resulting from passing vehicles) could be impacted over the life of the total proposed activities across each alternative.

3.4.3.5. PREFERRED ACTION ALTERNATIVE ENVIRONMENTAL CONSEQUENCES

The Preferred Action Alternative environmental consequences would be similar to those of the Proposed Action Alternative but would include an AMP for water resources. Differences in effects would be limited to aquatic resources and the plants and wildlife dependent on those resources. Only those differences are discussed in this section.

Wildlife Connectivity Impact Summary

Under the Preferred Action Alternative, there is a risk of riparian and aquatic resource loss that could affect the suitability of the CCC for species including the giant spotted whiptail, Sonoran desert toad, and Sonoran desert tortoise, for which an AGFD model identifies the CCC as the biologically best corridor for connectivity and movement. Losses of breeding habitat, drinking water, forage, cover, and mortality or inability to successfully move through the area are potential effects from pumping-induced changes that may occur due to the Preferred Action. The AMP outlined in **Section 2.3.1** would obligate Redhawk and the BLM to enhanced resource monitoring to mitigate probable groundwater drawdown effects from the Preferred Action groundwater pumping. Other potential indirect impacts on wildlife using the CCC for connectivity and movements would result from noise and vibrations, nighttime lighting, vibration from heavy machinery operation, or fugitive dust from activities. Mitigation measures outlined in **Section 2.2.10** may reduce potential impacts from these sources. Measures to minimize impacts include avoiding any riparian vegetation clearing; avoiding vegetation clearing, drilling or reclamation within 500 ft of the centerline of Copper Creek riparian areas yellow-billed cuckoo breeding season; installing a secondary muffler on drill rigs to reduce noise impacts; and minimizing light pollution at night by hooding and shielding lights, directing lights down toward the interior of the drill pads at night, and locating lights to reduce their visibility as viewed from a distance.

Residual Impacts

Residual impacts after implementation of the design features in **Section 2.2.10** and reclamation would be the same as stated in the Wildlife Connectivity Impact Summary above.

Past and Present Actions

Past and present actions are the same as for the Proposed Action Alternative.

RFFAs

RFFAs for the Preferred Action Alternative are the same as for the Proposed Action Alternative.

Cumulative Impacts Analysis

The Preferred Action Alternative, in combination with other past, present, and RFFAs, may reduce riparian and aquatic resource availability for species using the CCC for connectivity and movement that are reliant on these resources. These species most notably include the giant spotted whiptail, Sonoran desert toad, and Sonoran desert tortoise, for which the AGFD model identified the CCC as the biologically best corridor for connectivity and movements. Loss of breeding habitat, drinking water, forage, cover, and mortality or inability to successfully move through the area could result from implementation of the Preferred Action Alternative.

As discussed in **Section 3.4.3.3**, a maximum of 52 ac of the corridor could be directly impacted at a given time as a result of implementation of the Proposed and Preferred Action Alternative activities. Cumulatively, up to approximately 406 ac of the corridor (500 ft around each pad and 50 ft of proposed roads resulting from passing vehicles) could be impacted over the life of the total proposed activities across each alternative.

The AMP outlined in **Section 2.3.1**, however, would obligate Redhawk and the BLM to enhanced resource monitoring to mitigate probable groundwater drawdown effects from Preferred Action Alternative groundwater pumping. The implementation of the AMP would provide decision-makers with methods and information to determine whether Preferred Action Alternative groundwater pumping is the cause of a specific water resource parameter falling below a threshold and triggered measures (specific reductions in groundwater use for project purposes for the Preferred Action Alternative) when the BLM determines that project groundwater pumping is the cause of a specific water resource parameter falling below the threshold.

The BLM expects this additional information associated with future implementation of the AMP under this alternative would be a beneficial tool to consider when evaluating general wildlife movement and connectivity across the Project Area. Because of the additional monitoring information under the adoption of the AMP in the Preferred Action Alternative, the combined cumulative effects to wildlife movement and connectivity are expected to be lower than cumulative effects associated with the Proposed Action Alternative over time.

3.4.4. ISSUE STATEMENT 4

4. What are the potential impacts to hydrologic and hydrologic-dependent resources associated with Copper Creek due to groundwater withdrawals as stated in each alternative?

3.4.4.1. AFFECTED ENVIRONMENT

Hydrologic and hydrologic-dependent resources within the Project Area include Copper Creek, Bootlegger Spring, Number 19 Spring, vegetation influenced by Hendetta Spring, which is not within the Project Area, and species dependent on resources at Copper Creek and the springs.

The flow regime of Copper Creek is complex and not fully understood, with surface water presence varying both spatially and temporally within reaches. According to ADEQ, Upper Copper Creek (**Figure 4**) is classified as intermittent (ADEQ 2023, accessed 6/29/2023), while the ADWR describes it as perennial in the Arizona Water Atlas Volume 3 (ADWR 2012). This variability highlights the importance of seasonal water derived from winter rain and snowmelt, which helps sustain the creek's flow along with multiple springs. During summer, these flows often diminish, leaving isolated pools and short stretches of water until late summer or fall when monsoon systems return. Lower Copper Creek is not in the Project Area and therefore is excluded from further discussion.

Preferred Action Alternative vehicle traffic intersecting the creek will be limited to four road crossings to access project drill pads throughout the Project Area. A sediment-filled dam in the upper extent of the creek within the Project Area has a low-level outlet which was seeping water when WestLand visited the dam site in December 2022 and water was overtopping the dam, feeding Copper Creek below the dam. From the dam downstream to Prospect Canyon, Copper Creek had several reaches with surface water present during WestLand's biological field investigations in April, October, and December 2022, and during BLM field visits during October and November 2022, and April, July, and August 2023, as described in **Section 3.4.1.1**. Copper Creek supports perennial hydrophytic vegetation associated with the perennial surface flows and pools from the dam to approximately 2 miles downstream.

Sensitive resources associated with Copper Creek include various riparian plant species that are dependent or facilitated by the presence of perennial surface water or shallow groundwater, and aquatic invertebrates and vertebrates, including the threatened, yellow-billed cuckoo and BLM Sensitive lowland leopard frog and Sonora mud turtle. Aquatic-dependent species are discussed in detail in **Section 3.4.1.1** and **Section 3.4.2.1**. Although not an ESA or BLM Sensitive species, the black-necked garter snake is also present in Copper Creek likely due to its strong association with riparian areas.

Conditions at Hendetta, Bootlegger, and Number 19 springs during site visits in 2022 and 2023 are discussed in **Section 3.4.1.1**. Surface water observed during visits was associated only with Bootlegger Spring, where the patchwork of upland, facultative, and facultative wetland vegetation species surrounding the area with surface flow suggests intermittent flow from the spring source. Hendetta Spring primarily occurs on State Land, supplying water for livestock use and supporting riparian vegetation on BLM land. No further evaluation of Hendetta Spring is

warranted. During a brief site visit in November 2023, BLM and Redhawk staff were unable to locate Number 19 Spring; however, pools of water and facultative vegetation were noted in the channel near the mapped location.

Aravaipa Creek, within the Aravaipa Wilderness Area, is located approximately 10 miles north of the Project Area, in a separate watershed from the Project Area. Aravaipa Creek has long stretches of perennial surface flows and is also tributary to the San Pedro River. Due to the distance of the Project Area to Aravaipa Creek, no effects would be anticipated, and no further evaluation is warranted.

Two private wells (Hendrickson Well and Solar Well; **Figure 4**), are currently used by Redhawk to obtain water for exploratory drilling on private lands and for ranching operations. These wells would also be used by Redhawk for Proposed Action drill water supply. As noted in **Section 2.2.6**, a third well approximately 350 ft from the Hendrickson Well was recently installed as a backup for the Hendrickson Well because of the questionable condition of the casing in the original Hendrickson Well. Water is pumped from approximately 55 ft (original Hendrickson Well) and 200 ft (Solar Well) below ground surface. The original Hendrickson Well is within the Copper Creek channel west of, and approximately 300 ft downstream from BLM-managed land. The new Hendrickson Well is approximately 350 ft west of the original well, on a hillside outside the Copper Creek channel. Solar Well is more than 1 mile south of and 600 ft higher in elevation than Copper Creek at the dam and is in a different watershed (Mulberry Wash) than Copper Creek and all except three proposed drill pads.

Daily Proposed Action Alternative water requirements would depend on the type of drill and the number of drills (up to two) active at any time. Water would be pumped via PVC hoses placed along the side of roads from the two offsite, private wells. Based on previous drilling operations that Redhawk has completed with comparable equipment and the rated pumping capacity of the source wells (maximum capacity of not more than 35 gallons per minute), Redhawk estimates approximately 70,000 gallons of water would be pumped per month per drill rig (see **Section 2.2.6**), most of which would be pumped into the drill holes to lubricate and cool the drill bit and to remove loose material from the drilling operations. Water use for dust abatement purposes is included in that usage estimate and is expected to be negligible compared to the amount used for drilling operations due to a combination of the 10-mph speed limit and some roads traversing bedrock.

The two existing wells have been and are currently in use for ranching and for mineral exploration on non-federal lands. Any pumping for the Proposed Action Alternative would be replacing current pumping for other Redhawk drilling operations on non-federal lands.

3.4.4.2. NO ACTION ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, the Proposed Action Alternative would not occur. Impacts to aquatic resources, riparian vegetation, and dependent wildlife that could result from the No Action Alternative would be consistent with current land usage, including recreation, camping, driving motorized all-terrain vehicles, grazing, minimal mineral exploration, and development, and road maintenance, which would be expected to continue at similar levels to current use in the Project Area. Mineral exploration activities include Redhawk's exploration activities on Arizona State Trust Lands and Private lands as well as the activities on BLM- administered public lands outlined in their active Notice (Notice; AZAZ106362501).

The Notice level operations includes up to 4.06 acres of ground disturbance for nine drill pads and associated access roads and would utilize one drill rig and up to 70,000 gallons of water per month.

3.4.4.3. PROPOSED ACTION ENVIRONMENTAL CONSEQUENCES

The Proposed Action Alternative may affect aquatic resources, riparian vegetation, and wildlife species dependent on those resources on BLM lands. Groundwater pumping for project purposes and the potential for reductions of surface and shallow groundwater availability may have scaling effects specific to the affected resource. Reductions in surface flow may disrupt the water/sediment balance, lowering the transport capability of the stream, affecting aquatic habitat and surface water expression. Reductions in surface water would reduce available habitat for aquatic wildlife and aquatic vegetation. Reductions in surface water would reduce water availability for terrestrial wildlife. Reductions in surface water would result in increases of water temperature and decreases in water quality. Reductions of groundwater levels would have negative effects for riparian vegetation, relatively shallow-rooted hydrophytes dependent on surface water availability.

Effects to aquatic resources, riparian vegetation, and dependent wildlife due to groundwater use may occur during periods when runoff from precipitation is not available for the resources, most typically during May through July, prior to initiation of summer monsoon storms. During the driest times of year, surface water is expected to be found only in pools and possibly isolated areas of low flows in Upper Copper Creek. WestLand has noted pools in Upper Copper Creek up to approximately 2 to 4 ft deep when there was no connecting surface flow between pools. The Proposed Action has the potential to lower groundwater during these dry times, resulting in reduction or cessation of flows and declines or elimination of pools in Upper Copper Creek, which may affect riparian species and the habitat and ecosystem services that those riparian species provide. Riparian-dependent species would be most vulnerable, as discussed in previous sections, but other species that use riparian resources on occasion would need to find alternate resources.

The maximum anticipated Proposed Action groundwater pumping would be approximately 5.2 acre-feet-annually (AFA) for 3 years, although this total does not account for times of no drilling activity, expected to be up to 3 month per year, or when only one drill rig is working on the project. Reliable hydrologic data for the local Copper Creek watershed is lacking. The ADWR does not have and is not aware of the existence of estimates of groundwater pumping data for the Lower San Pedro River basin, in which the Proposed Action is located (K. Nelson, ADWR pers. comm. to S. Hart, February 6, 2023).

Groundwater Pumping Impact Summary

Under the Proposed Action impacts to surface water and groundwater levels resulting from groundwater pumping are unknown. Those water levels, and the habitats and communities dependent upon them, may be affected by actions under the Proposed Action. There is a risk of reduction or cessation of flows, declines or elimination of pools, and lowering of the groundwater table in Upper Copper Creek. If this occurs, it is likely to affect riparian species and the habitat and ecosystem services that those riparian species, and the surface water itself provide. For terrestrial species this could lead to loss of available breeding habitat, drinking

water, forage, cover, and mortality or inability to successfully move through the area. For aquatic animal species this could lead to changes in habitat quality or loss of habitat entirely, habitat fragmentation, loss of breeding habitat, loss of forage, and mortality. For riparian vegetation this could lead to reduced vigor and mortality, loss of germination capability or survivorship of seedlings, contraction of riparian area, and conversion to a more xeric vegetation community. These impacts could be delayed and have effects after the pumping-induced change occurs and after the Proposed Action is completed.

Residual Impacts

Residual impacts would be the same as stated in the Groundwater Pumping Impact Summary above. As a result of enhanced monitoring (as defined in the AMP) of hydrologic resources and those species and process dependent on those resources, adverse residual impacts to riparian and aquatic dependent species may occur but are not expected to have long-term, significant effects.

3.4.4.4. CUMULATIVE IMPACTS

The acreages of past and present actions and RFFAs in the 92,257-acre CESA (**Figure 6**) are listed in **Table 3-2**, as tallied from the BLM's RLMA (active and expired = past and present actions; pending = RFFAs), the BLM National Operations Center, the National Interagency Fire Center, and estimates from Google Earth aerial photography. Those past and present actions within the CESA total approximately 2,000 ac (2.17 percent of the CESA). This includes authorized and expired mineral exploration and mining notices of intent and plans of operation, and mineral material disposal sites, totaling 115 ac (0.12 percent of the CESA); agricultural lands covering 1,000 ac (1.1 percent of the CESA); miscellaneous structures and fields totaling 250 ac (0.27 percent of the CESA); fires since 2003 that have burned approximately 600 ac (0.65 percent) of the CESA; and 5 ac (<0.01 percent of the CESA) for reasonably foreseeable mining activities. Grazing allotments cover approximately 40,000 ac (43.4 percent) of the CESA.

Past and present actions that could have impacted and may be currently impacting riparian and aquatic resources related to groundwater in the CESA include several activities. Mineral mining and exploration first started in the area in the early 1900s on private as well as State Trust and BLM lands. Mining activity has resulted in degradation of water quality. ADEQ lists Upper Copper Creek as impaired for copper, iron, selenium, cadmium, and zinc (ADEQ 2024). Currently, there are remedial projects including evaporation ponds and monitoring wells within the Project Area to address those historical impacts of mining. Historic land uses for agriculture, ranching, and residences (land clearing, planting, fertilizer and pesticide use, water infrastructure, stock tanks, pumping, cisterns, fencing, road infrastructure, maintenance, livestock, feeding and supplements, etc.) have occurred in the area since the 1800s and continue today. A common land use is recreation including hunting, dispersed camping, OHV use, and travel through the CESA to U.S. Forest Service lands, Arizona State lands, and private lands. Surface disturbances include existing roads on approximately 5 ac of BLM lands, previous improvements for drill pads and roads on approximately 12 ac of BLM lands, and additional miscellaneous areas of disturbance visible on aerial photos that are likely associated with mining activities. Wildfires have been part of the landscape in the past and will likely have impacts in the future.

Direct impacts to aquatic resources from the above activities could include detrimental changes in habitat quality or loss of habitat entirely, habitat fragmentation, loss of breeding habitat, loss of forage, and mortality for aquatic wildlife. Direct impacts to riparian vegetation could include reduced vigor and mortality, loss of germination capability or survivorship of seedlings, contraction of riparian areas, and conversion to a more xeric vegetation community.

Potential indirect impacts to riparian and aquatic resources in the CESA primarily would have resulted from groundwater pumping associated with mineral mining and exploration, agriculture, ranching, and livestock grazing, infrastructure, dispersed recreation, and wildfires. Reductions in surface water reduce water availability for terrestrial and aquatic wildlife, decrease water quality and have negative effects for riparian vegetation and hydrophytes dependent on surface water availability. Disturbance to aquatic resources from past and present actions within the CESA would have been reduced some through the cessation of these activities and the associated groundwater pumping, including the retirement of multiple wells previously used for agriculture along the San Pedro River within the CESA (Haney 2005). These retired wells are within the CESA but are located along the San Pedro River and not likely relevant to the Project Area.

Effects from the Proposed Action, in coordination with the past and present actions in the CESA, groundwater pumping on surface water accessibility for wildlife and subsurface water accessibility for riparian vegetation may have a detectable difference for these biological resources; changes in species health and behavior and vegetation abundance, vigor, and community composition may occur.

RFFAs

Potential impacts to water resources within the CESA from mineral exploration, agriculture, livestock grazing, associated infrastructure, dispersed recreation, and wildfires are expected to continue. The SFO plans to designate a comprehensive network of motorized routes and trails for managing travel within this project vicinity that could affect impacts to water resources in the CESA.

Cumulative Impacts Analysis

The Proposed Action Alternative, in combination with other past and present impacts, may reduce surface and groundwater resource availability, including flows and pools and lower the groundwater table in Upper Copper Creek. For species that are reliant on water resources, this could lead to loss of habitat, decreased survivorship of riparian seedlings, lost breeding habitat for aquatic and terrestrial species, habitat fragmentation, reductions of water quality, changes in geomorphic processes, loss of available drinking water, loss of forage and potential vegetation community shifts, loss of cover and impediment of migration through the wildlife corridor, changes in predation, and mortality of aquatic, terrestrial, or vegetative species.

3.4.4.5. PREFERRED ACTION ALTERNATIVE ENVIRONMENTAL CONSEQUENCES

The Preferred Action Alternative environmental consequences would be similar to those of the Proposed Action Alternative but would include an AMP as a mitigation measure and obligate Redhawk and the BLM to enhanced monitoring for effects of pumping groundwater resources. Groundwater pumping for project purposes and the potential for reductions of surface and shallow groundwater availability may have scaling effects specific to the affected resource. Reductions in surface flow may disrupt the sediment balance, lowering the transport capability of the stream, affecting aquatic habitat and surface water expression. Reductions in surface water would reduce available habitat for aquatic wildlife and aquatic vegetation. Reductions in surface water would reduce water availability for terrestrial wildlife. Reductions in surface water would result in increases of water temperature and decreases in water quality. Reductions of groundwater levels would have negative effects for riparian vegetation, relatively shallow-rooted hydrophytes dependent on surface water availability.

Under the Preferred Action Alternative, the thresholds and triggers in the AMP are designed to moderate potential effects on project groundwater pumping on Upper Copper Creek so that RMP water, riparian, and wildlife resources objectives are met.

In addition, the AMP for monitoring groundwater levels along Copper Creek would provide baseline data that could be used as data input for hydrologic modeling of the system, following multiple years of data collection.

Groundwater Pumping Impact Summary

Under the Preferred Action Alternative, the AMP ensures enhanced monitoring, however, there remains a risk of reduction or cessation of flows, declines or elimination of pools, and lowering of the groundwater table in Upper Copper Creek, particularly between monitoring reporting periods. If this occurs, it is likely to affect riparian species and the habitat and ecosystem services that those riparian species, and the surface water itself provide. For terrestrial species, this could lead to loss of available breeding habitat, drinking water, forage, cover, and mortality or inability to successfully move through the area. For aquatic animal species this could lead to detrimental changes in habitat quality or loss of habitat entirely, habitat fragmentation, loss of breeding habitat, loss of forage, and mortality. For riparian vegetation this could lead to reduced vigor and mortality, loss of germination capability or survivorship of seedlings, contraction of riparian area, and conversion to a more xeric vegetation community. These effects could be delayed and have long-lasting effects after the pumping-induced change occurs and after the Preferred Action Alternative is completed.

Residual Impacts

Residual impacts after implementation of the enhanced monitoring as detailed in the AMP would be the same as stated in the Groundwater Pumping Impact Summary above.

Past and Present Actions

Past and present actions are the same as for the Proposed Action Alternative.

RFFAs

RFFAs for the Preferred Action Alternative are the same as for the Proposed Action Alternative.

Cumulative Impacts Analysis

The Preferred Action Alternative, in combination with other past and present impacts and the use of the AMP, is not expected to reduce surface and groundwater resource availability, including reductions in flows and pools or in the groundwater table in Upper Copper Creek.

The AMP outlined in **Section 2.3.1** would obligate Redhawk and the BLM to enhanced resource monitoring to mitigate probable groundwater drawdown effects from Preferred Action Alternative groundwater pumping. The implementation of the AMP would provide decision-makers with methods and information to determine whether Preferred Action Alternative groundwater pumping is the cause of a specific water resource parameter falling below a threshold and triggered measures (specific reductions in groundwater use for project purposes for the Preferred Action Alternative) when the BLM determines that project groundwater pumping is the cause of a specific water resource parameter falling below the threshold.

Because of the expected information associated with future implementation of the AMP under this alternative, it is expected that the cumulative impacts to hydrologic and hydrologic-dependent resources associated with Copper Creek due to groundwater withdrawals would be lower than those cumulative impacts to hydrologic and hydrologic-dependent resources under the Proposed Action Alternative over time.

4.0 CONSULTATION AND COORDINATION

4.1. INTRODUCTION

The issue identification section of **Section 1.0** identifies those issues which were analyzed in detail in **Section 3.0**. The issues were identified through the public and agency involvement process described in this section.

4.2. PERSONS, GROUPS, AND AGENCIES CONSULTED

Table 4-1 lists the persons, groups, and agencies that were coordinated with or consulted during the preparation of this project. The table also summarizes the conclusions of those processes.

Table 4-1. Coordination and Consultation

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Arizona State Historic Preservation Office	National Historic Preservation Action Section 106	
U.S. Fish and Wildlife Service	Endangered Species Act Section 7	
Tribes	Government to Government Consultation Policy	
Arizona Game and Fish Department	Cooperating Agency	

4.3. SUMMARY OF PUBLIC PARTICIPATION

Issues were identified by the BLM Interdisciplinary Team as documented in the Interdisciplinary Team Checklist, which is attached to this document as **Appendix A**. Issues to be analyzed in detail are summarized in **Section 1.0** and carried forward for detailed description and analysis in **Section 3.0**.

4.4. LIST OF PREPARERS

The specialists listed in the following table(s) assisted in the preparation of this EA.

Table 4-2. BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Sharisse Flatt	Field Manager	Project Management
Roberta Lopez	Non-Renewable Assistant Field Manager	Project Management
Amelia Taylor	Renewable Assistant Field Manager, Biologist Support	Project Management, Wildlife
Shelby Leachet	Planning and Environmental Specialist, Renewable Assistant Field Manager	Quality Assurance
Carlos Herdocia	Geologist, Project Lead	Project Co-Lead
Daniel Moore	Geologist, Primary Project Lead	Project Co-Lead
George Maloof	Archeologist	Cultural Resources
Matthew Stewart	Hydrologist	Water Resources
Peggy Monkemeier	Natural Resource Specialist, Biologist Support	Biological Resources, Wildlife, Vegetation
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Heidi Blasius	Fisheries Biologist	Biological Resources, Wildlife, Vegetation
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Table 4-3. WestLand Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Brian Lindenlaub	Discipline Service Lead	Quality Assurance
Scott Hart	Senior Environmental Consultant	Project Lead
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Avi Buckles	Cultural Resources Director	Cultural Resources
Robert Archer	Noise Specialist	Noise Analysis

5.0 REFERENCES, GLOSSARY AND ACRONYMS

5.1. INTRODUCTION

The following sections list the references cited within this document, the terms used and their definitions, and the acronyms used and their meanings.

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5.3. GLOSSARY OF TERMS

ACRE-FEET PER ANNUM OF WATER: Enough water to cover one acre of land 1 foot deep for a year.

ADAPTIVE MANAGEMENT (AM): AM is a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. AM also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. AM does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals; increases scientific knowledge; and reduces tensions among stakeholders.

ALLOTMENT: An area of land where one or more individuals graze their livestock.

ANIMAL UNIT MONTH: The amount of dry forage required by one animal unit for one month based on a forage allowance of 26 pounds per day.

AUTHORIZED OFFICER: The decision maker who has the delegated authority to for that decision.

BEST MANAGEMENT PRACTICES: A suite of techniques that guide, or may be applied to, management actions to aid in achieving desired outcomes.

CONDITIONS OF APPROVAL: Conditions or requirements under which a decision is made.

ENVIRONMENTAL ASSESSMENT: A concise public document that analyzes the environmental impacts of a proposed action and provides enough evidence to determine the level of significance of the impacts.

ENVIRONMENTAL IMPACT STATEMENT: A detailed written statement of environmental effects of a major federal action significantly affecting the quality of the human environment.

EXCELSIOR: An erosion control material made from wood shavings that may be used in several configurations of erosion control products.

FORAGE: Vegetation eaten by animals, especially grazing and browsing animals.

FRAGMENTATION (HABITAT): The break-up of a large land area (such as a forest) into smaller patches isolated by areas converted to a different land type.

IMPACT: A modification of the existing environment caused by an action (such as construction or operation of facilities).

INTERDISCIPLINARY TEAM: Representatives of various disciplines designated as members of a team which was created to prepare an environmental document.

INVASIVE PLANTS: Plants that are not part of (if exotic) or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth is not actively controlled by management interventions.

MINIMIZE: To reduce the adverse impact of an operation to the lowest practical level.

MITIGATION: Steps taken to 1) avoid an impact; 2) minimize an impact; 3) rectify an impact; 4) reduce or eliminate an impact over time; or, 5) compensate for an impact.

MONITORING: The process of collecting and assessing data/information necessary to evaluate the effectiveness of a decision or its conditions of approval.

MULTIPLE USE: The management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

NO ACTION ALTERNATIVE: The most likely condition to exist in the future if current management direction were to continue unchanged.

NOXIOUS WEEDS: A plant species designated by Federal of State law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the United States.

OFF-HIGHWAY VEHICLE: Any motorized vehicle capable of or designed for travel on or immediately over land.

PERIOD OF USE: The time of livestock grazing on a range area based on type of vegetation or stage of vegetative growth.

PERMIT: A revocable authorization to use public land for a specified purpose for a specified period of time.

PLAN OF DEVELOPMENT: A plan developed by a project applicant that specifies the techniques and measures to be used during construction and operation of the project.

PROJECT AREA: The area of land potentially affected by a proposed project.

PROPERLY FUNCTIONING CONDITION: The ability of an area to maintain the ecological processes and values associated with the potential of that specific area, such as habitat quality and clean water.

RANGELAND HEALTH: The degree to which the integrity of the soil, the vegetation, the water, and air as well as the ecological processes of the rangeland ecosystem is balanced and sustained.

REVEGETATION: Re-establishing desirable plants in areas where desirable plants are absent or of inadequate density, by management alone (natural revegetation) or by seeding or transplanting (artificial revegetation).

SCOPING: The process of identifying the issues, management concerns, preliminary alternatives, and other components of an environmental document.

SIGNIFICANCE: A determination of the degree or magnitude of importance of an effect, whether beneficial or adverse.

TIMING LIMITATION: A constraint that prohibits specified activities during specified time periods to protect identified resource values.

UTILIZATION: The proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects).

VALID EXISTING RIGHTS: Rights that existed before a change in law, policy, or plan that would not be altered by that change.

5.4. LIST OF ACRONYMS

The following is a list of acronyms and their meanings that are frequently used by the BLM and which may have been used in the writing of this document.

Acronym	Definition
ACEC	Area of Critical Environmental Concern
ACEPM	Applicant-Committed Environmental Protection Measure
ADWR	Arizona Division of Water Resources
AEMP	Aravaipa Ecosystem Management Plan
AFA	Acre-foot/feet per Annum
AMP	Adaptive Management Plan
AWA	Aravaipa Wilderness Area
AGFD	Arizona Game and Fish Department
AO	Authorized Officer
APD	Application for Permit to Drill
APE	Area of Potential Effect
AUM	Animal Unit Month
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BMP	Best Management Practice
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
IAA	Impact Area of Analysis
COA	Condition of Approval
CWA	Clean Water Act
DAQ	Division of Air Quality

Acronym	Definition
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FO	Field Office
FONSI	Finding of No Significant Impact
GB	Gila Box
GBMP	Gila Box Management Plan
GBRNCA	Gila Box Riparian National Conservation Area
GHG	Green House Gas
GIS	Geographic Information System
HAP	Hazardous Air Pollutants
IAA	Impact Area of Analysis
IDT	Interdisciplinary Team
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NI	Not Impacted
NP	Not Present
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
OHV	Off-highway Vehicle
OSHA	Occupational Safety and Health Act
PAC	Protected Activity Center
PIF	Partners in Flight
PRISM	Parameter-elevation Regressions on Independent Slopes Model
PUP	Pesticide Use Proposal
RCRA	Resource Conservation and Recovery Act of 1976
RFD	Reasonably Foreseeable Development
RFFA	Reasonably Foreseeable Future Actions
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-way
SARA	Superfund Amendments and Reauthorization Act
SDR	State Director Review
SHPO	State Historic Preservation Office
SMA	Surface Management Agency
SPCC	Spill Prevention, Control and Countermeasure
SRMA	Special Recreation Management Area
SUPO	Surface Use Plan of Operations
TDS	Total Dissolved Solids

Acronym	Definition
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRM	Visual Resource Management
WA	Wilderness Area
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area
WUI	Wildland Urban Interface

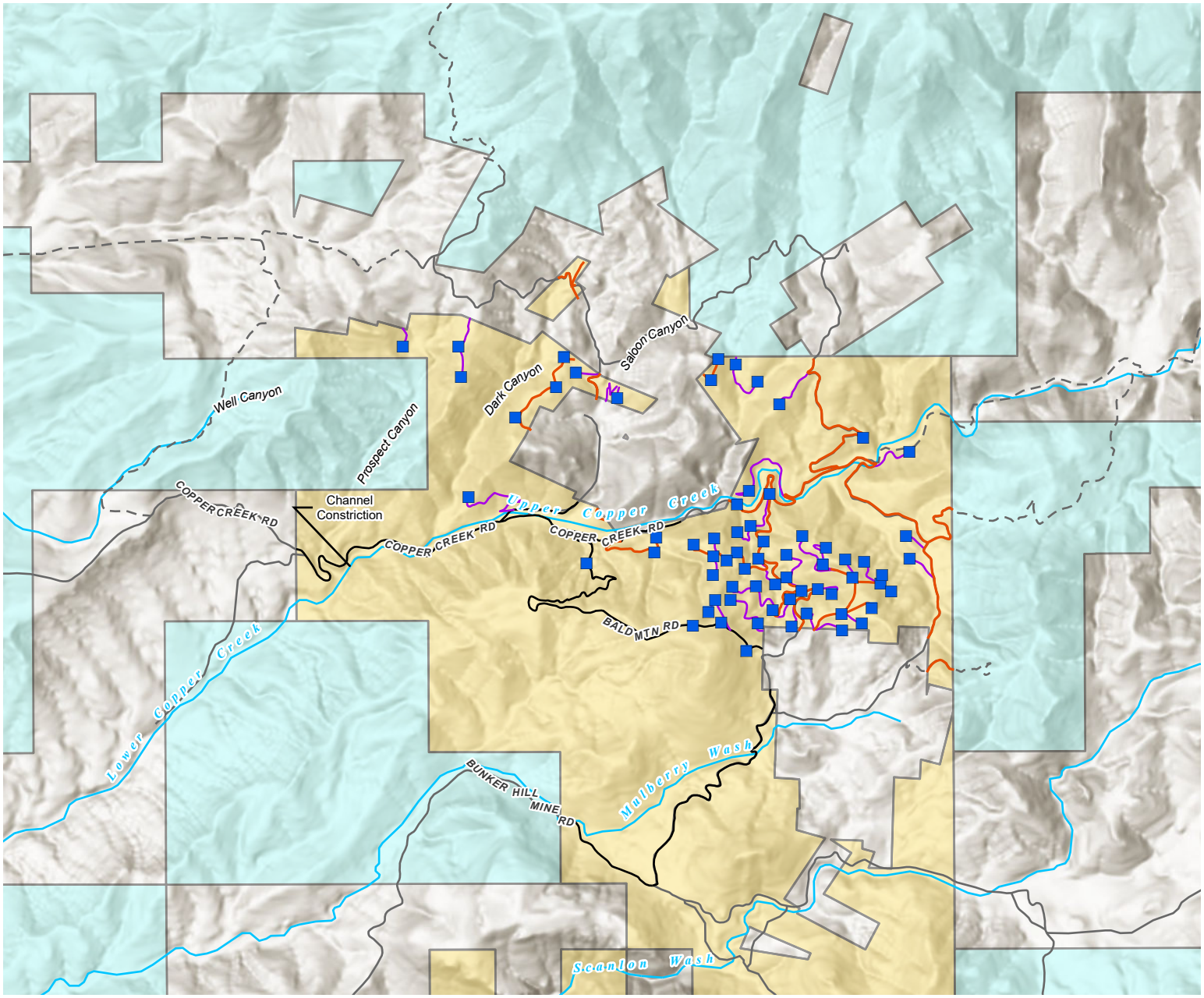
FIGURES

SAFFORD FIELD OFFICE

Copper Creek Exploration Environmental Assessment

VICINITY MAP

Figure 1



- Drill Pad

Road Classification

- Currently Used Access Road; Maintenance/Improvement
- Re-established, Previously Reclaimed Access Road
- Drive-Only Road
- Roads Not Used or Not on BLM Land

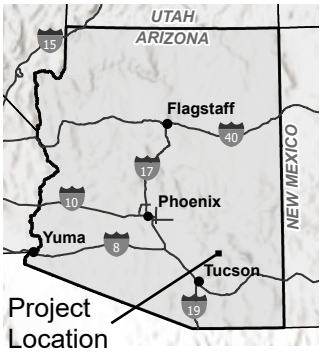
- Roads Not Used or Not on BLM Land

Surface Management

- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land

0 1,500 3,000 Feet

0 500 1,000 Meters



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10/31/2024

T8S, R18E, Portions of Sections 3, 4, 10, 11, 14 and 15,
Pinal County, Arizona
Image Source: ArcGIS Online, World Hillshade
Contour interval 100-feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Decisions in this document only apply to BLM lands.

0 125 250 Miles

T8S, R18E, Portions of Sections 11, and 14,
Pinal County, Arizona
Projection: NAD 1983 UTM Zone 12N
Surface Management: BLM 2022, WestLand modified 2023
Image Source: Maxar 07/1/2023

Legend

- Well
- Drill Pad

Road Classification

- Existing Road to be Re-established
- Minor Maintenance
- No Modification Required
- Unpatented Claim

Surface Management

- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land

N

0 600 1,200 Feet

0 175 350 Meters

WestLand Engineering & Environmental Services

REDHAWK COPPER
Copper Creek
BLM Notice

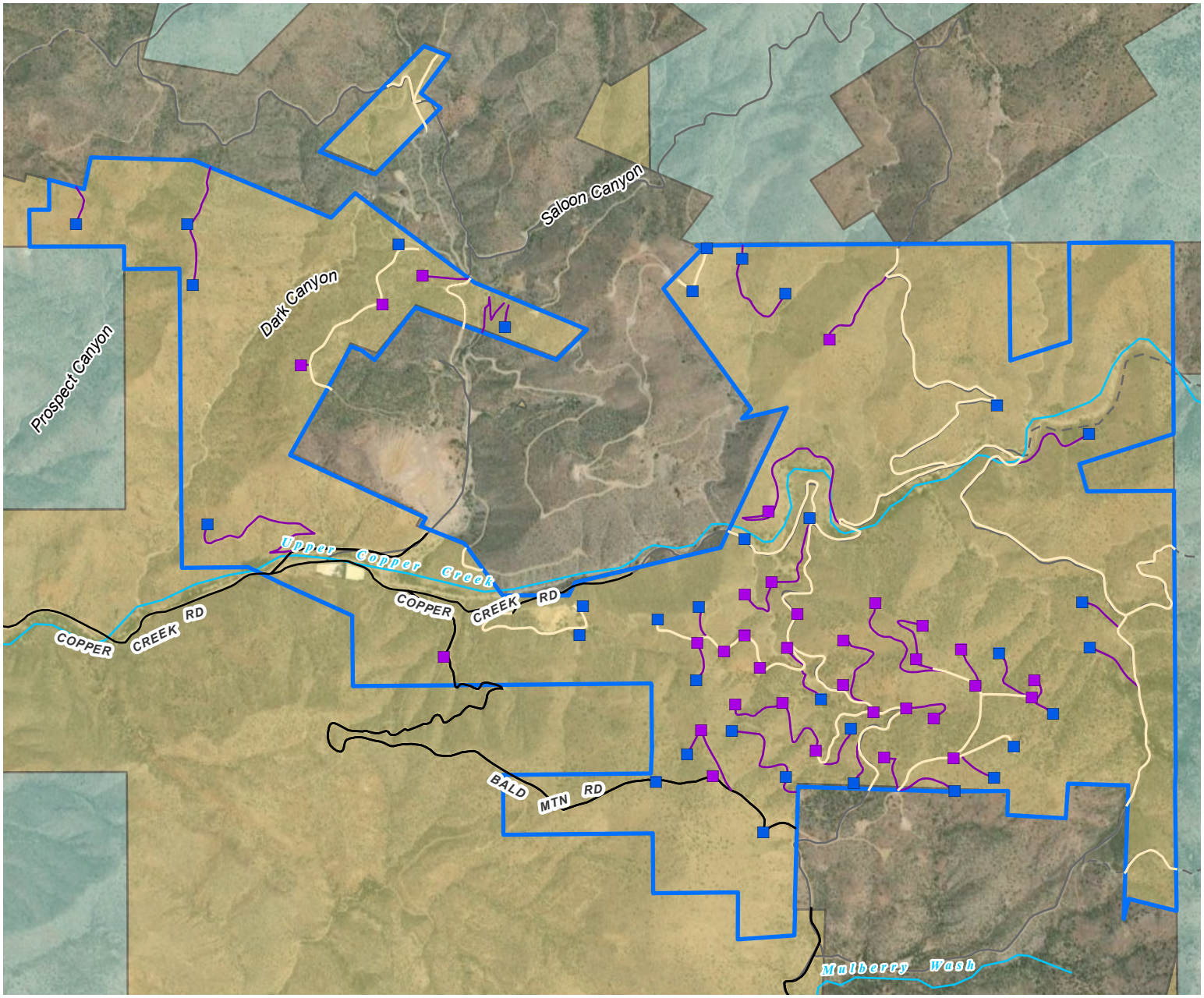
BLM NOTICE MAP
Figure 2

SAFFORD FIELD OFFICE

Copper Creek Exploration Environmental Assessment

AERIAL OVERVIEW

Figure 3



- 40' x 60' Pad
- 70' x 70' Pad

Road Classification

- Currently Used Access Road; Maintenance/Improvement
- Re-established, Previously Reclaimed Access Road
- Drive-Only Road

- Unpatented Claims Boundary

Surface Management

- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land

0 750 1,500 Feet

0 250 500 Meters

Projection: NAD 1983 UTM Zone 12N
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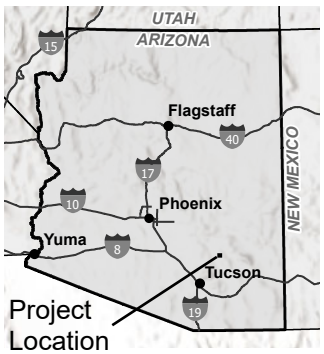
10/31/2024



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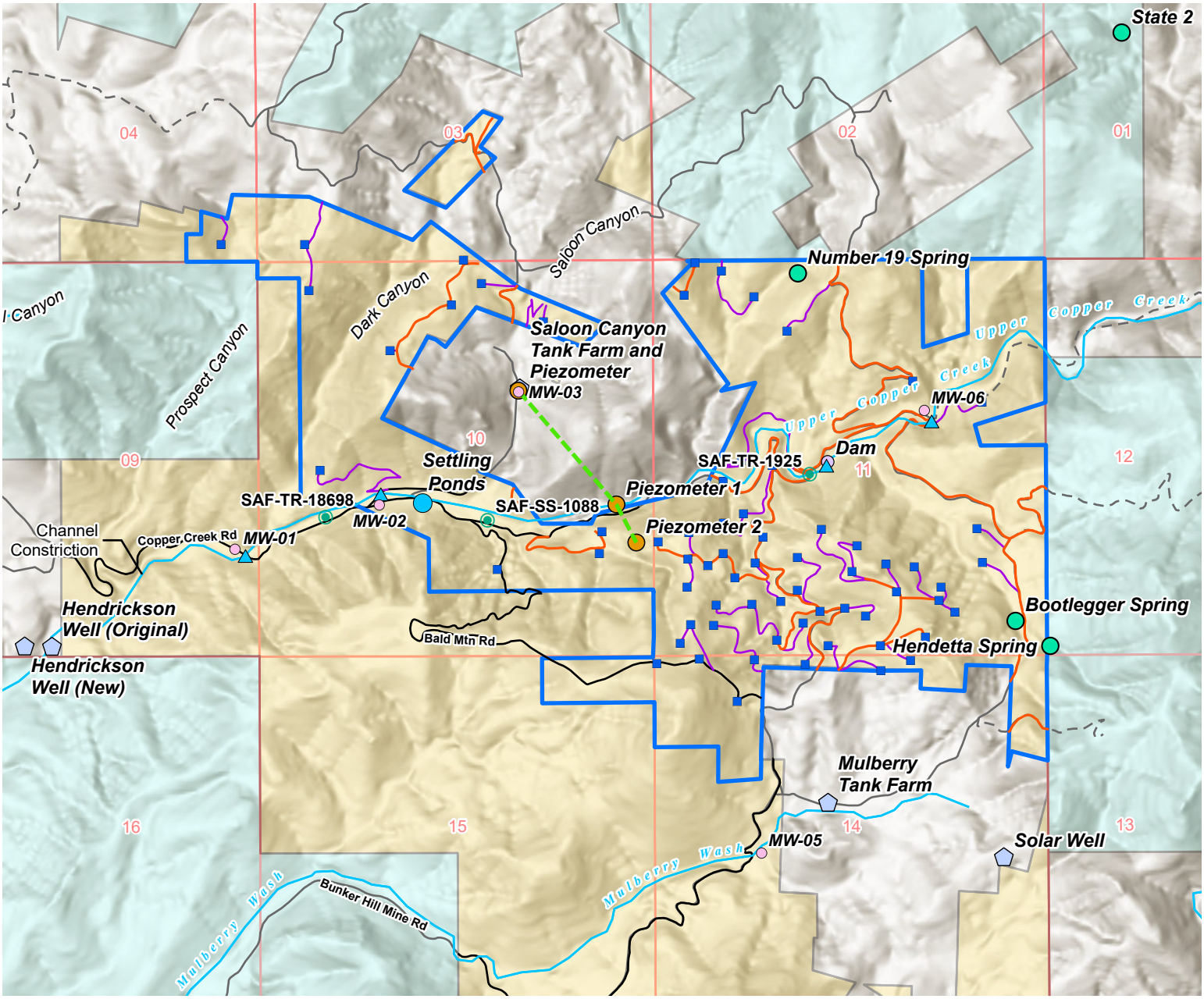
T8S, R18E, Portions of Sections 3, 4, 10, 11, 14 and 15,
Pinal County, Arizona,
Image Source: Maxar 02/17/2020

SAFFORD FIELD OFFICE

Copper Creek Exploration Environmental Assessment

SPRINGS AND WELLS

Figure 4



- Drill Pad
- AIM Plot and Depth to Groundwater Monitoring
- Monitoring Well
- Piezometer Projected to Surface
- Settling Ponds
- Copper Creek Road Crossing
- Spring
- Well or Tank Farm

Road Classification

- Currently Used Access Road; Maintenance/Improvement
- Re-established, Previously Reclaimed Access Road
- Roads Not Used or Not on BLM Land
- Roads Not Used or Not on BLM Land
- Drive-Only Road
- PZ Underground Path
- Unpatented Claims Boundary

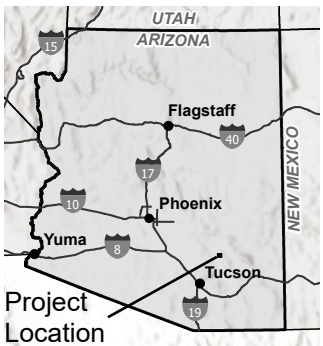
Surface Management

- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land

T8S, R18E, Portions of Sections 3, 4, 10, 11, 14 and 15,
Pinal County, Arizona
Data Source: USGS Hydrologic Unit Code
Image Source: ESRI World Hillshade

0 1,000 2,000 Feet
0 300 600 Meters

Projection: NAD 1983 UTM Zone 12N
Scale: 1:24,000 at 8.5x11 page output
10/31/2024

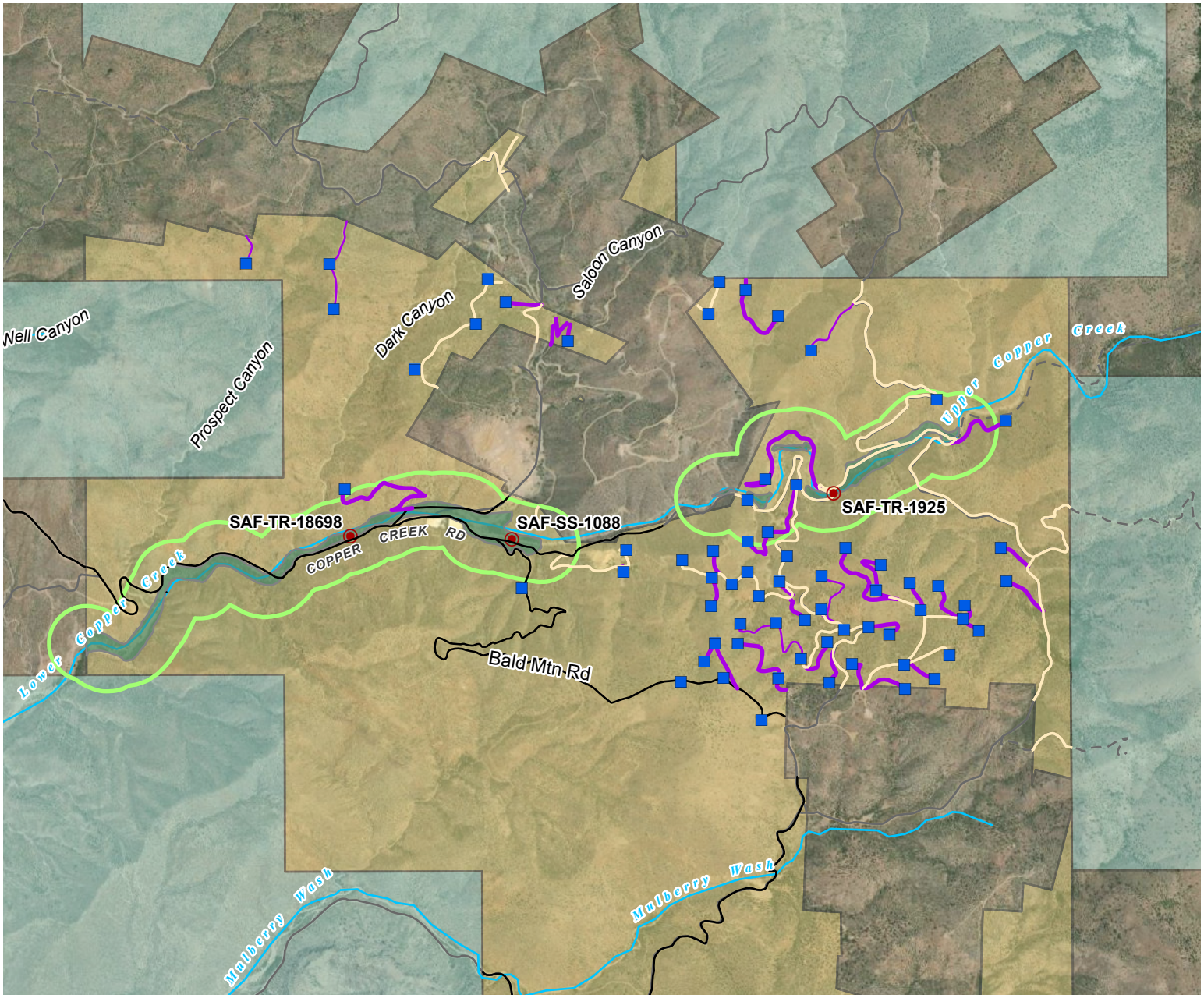


SAFFORD FIELD OFFICE

Copper Creek Exploration Environmental Assessment

RESTRICTED RIPARIAN DRILLING AREA MAY 25 TO SEPTEMBER 30

Figure 5



- Drill Pad
- AIM Plot and Depth to Groundwater Monitoring

Road Classification

- Currently Used Access Road; Maintenance/Improvements
- Re-established, Previously Reclaimed Access Road
- Drive-Only Road

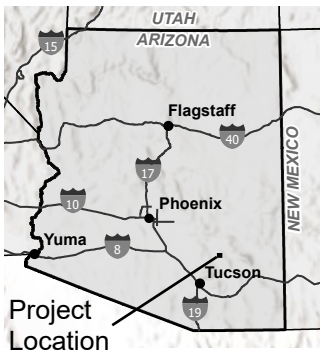
- Riparian Vegetation
- 500-ft Riparian Buffer

Surface Management

- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land

0 1,000 2,000 Feet
0 300 600 Meters

Projection: NAD 1983 UTM Zone 12N
Scale: 1:24,000 at 8.5x11 page output
10/31/2024



0 125 250 Miles

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T8S, R18E, Portions of Sections 3, 4, 10, 11, 14 and 15,
Pinal County, Arizona,
Image Source: Maxar 07/21/2023

Safford Field Office

Copper Creek Exploration Environmental Assessment

CUMULATIVE EFFECTS STUDY AREA AND THE SANTA CATALINA/RINCON GALIURO LINKAGE

Figure 6

Project Area
Buffered Project Area
Cumulative Effects Study Area
Santa Catalina/Rincon Galiuro Linkage

0 4 8 Miles
0 7.5 15 Kilometers

Projection: NAD 1983 UTM Zone 12N
Scale: 1:506,880 at 11x17 page output
Detail Scale: 1:1:253,440
11/1/2024

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Decisions in this document only apply to BLM lands.

T8S, R18E, Portions of Sections 3, 4, 10, 11, 14 and 15,
Pinal County, Arizona,
Data Source: AZGF AZ Linkage Detailed Linkage Design
Image Source: Maxar 02/17/2020 and World Topographic Map

UTAH
ARIZONA
NEW MEXICO
Flagstaff
Phoenix
Yuma
Tucson
Project Location

0 125 250 Miles

APPENDIX A

Interdisciplinary Team Checklist

APPENDIX A. INTERDISCIPLINARY TEAM CHECKLIST

Interdisciplinary Team Checklist

Resources and Issues Considered (Includes Supplemental Authorities Appendix 1 H-1790-1)

Project Title: Copper Creek Exploration Project

NEPA Log Number: DOI-BLM-AZ-G010-2023-0003-EA

File/Serial Number: AZA-038540

Project Leader: Dan Moore (Tucson Field Office BLM)

Determination of Staff: *(Choose one of the following abbreviated options for the left column)*

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Table Appendix A-1. Interdisciplinary Team Checklist

Determination	Resource/Issue	Rationale	Initial	Date
NI	Air Quality	Emissions associated with the Proposed Action (road surface maintenance, well pad construction and the drilling and operation of potentially 67 exploratory well sites) would result in criteria air pollutant emissions. Emissions would occur from vehicle transportation to and from the site, use of equipment for construction and operation, and well drilling and operation. Based on information from mitigation and incorporation of best available operating practices from the proponent into proposed project design the emissions associated with the proposed action would not be impacted to a degree that detailed analysis is necessary..	DC	1/20/23
NI	Cultural: Archaeological Resources	Based on the Copper Creek surveys conducted in 2006 (Dolan and Lindley 2007), 2011 (Hooper and King 2011),[1] and 1998 (1998-485.ASM), where five sites were identified (AZ BB:3:47[ASM]; AZ BB:3:34[ASM]; AZ BB:7:22[ASM];AZ BB:7:23[ASM]; and AZ BB:2:195[ASM]), compounded with the fact that land disturbances from the current project will not include more than minor expansion past previously disturbed areas, no known cultural resources will be impacted by the Proposed Action.	GM	01/20/23
NP	Cultural: Native American Religious Concerns	Pursuant to the American Indian Religious Freedom Act of 1978 (42 USC 1531) and National Historic Preservation Act (NHPA) (16 USC 131) Native American Tribes were notified of the project by letter mailed 2/17/2023. Letters were received from the Pasqua-Yaqui Tribe on 2/22/2023, the White Mountain Apache Tribe on 3/17/2023, and the Ak-Chin Indian Community on 4/3/2023. There are no identified Native American Traditional Cultural Properties within the Project Area.	GM	9/18/2023
NP	Designated Areas: Areas of Critical Environmental Concern	None present per GIS scoping report 9/24/22	DC/SL	01/20/23

Determination	Resource/Issue	Rationale	Initial	Date
NP	Wild and Scenic Rivers	None present per GIS scoping report 9/24/22	DC/SL	01/20/23
NP	Designated Areas: Wilderness Study Areas	None present per GIS scoping report prepared on 9/24/22	DC/SL	01/20/23
NI	Socioeconomics	A review of the Implementation of the Proposed Action could cause temporary construction impacts to residents and businesses in the local community, including increased noise and dust in the project area. Due to the limited scope of the project on public lands, this resource does not require additional analysis for this project as defined.	DC/SL	01/20/23
NP	Farmlands (prime/unique)	None present per GIS scoping report prepared on 9/24/22	DC	1/20/23
NP	Fuels/Fire Management	There are no fire or fuels management activities occurring within the project area.	DQ	01/20/23
NI	Geology / Minerals / Energy Production	The Proposed Action is mineral exploration drilling and sampling. Extracting drill core will have negligible effects on geological resources. While exploration activities can lead to mineral development, such development is speculative at this time. Should mineral development be proposed in the future, such development would require separate NEPA compliance.	DM	1/26/23
NI	Lands/Access/ROW, leases	After running a LR2000 data report and reviewing Safford Field Office (SFO) Bureau of Land Management (BLM) GIS data, no issues are present for the SFO BLM Lands and Realty resource. An established power line appears on current data sets; however, that right-of-way (ROW) authorization has been relinquished and the electrical line and poles have been removed.	CG	11/01/23
NP	Lands with Wilderness Characteristics	None present per GIS scoping report prepared on 9/24/22	DC	01/20/23

Determination	Resource/Issue	Rationale	Initial	Date
NI	Livestock Grazing & Rangeland Health Standards	The Proposed Action disturbance is on existing pads and existing roads. There are two allotments in the proposed project. The first allotment is the Reliable allotment. It is 702 acres of BLM administered lands in size and is grazed by Sombrero Butte Cattle LLC year-round. The permit is for 48 animal unit months (AUMs). The second allotment is the Copper Creek allotment. It is 2126 acres of BLM administered lands in size and is grazed by Sombrero Butte Cattle LLC year-round. The permit is for 204 AUMs. With appropriate reclamation, monitoring, and compliance of the project activities (as currently proposed), short-term or long-term impacts to both grazing and rangeland health standards should not be impacted to a level that would require additional analysis at this time.	TS	1/20/23
NP	Paleontology	While Cretaceous age sedimentary rock units are found in the project area, the potential for intact fossils in the area is low. The limestones, conglomerates, sandstones, and shales have been faulted and intruded by igneous rocks. Some of the sandstone has been metamorphosed to quartzite. Any fossils that existed in the sedimentary rocks were likely destroyed during these later events.	DM	01/26/23
NI	Plants: Invasive and Noxious Weeds	Invasive plants and noxious weeds issues will be mitigated using BLM-determined Best Management Practices (BMPs), including cleaning and inspection of all equipment prior to entry onto public lands, minimizing soil disturbance to the most practical extent, and use of certified weed-free native seed mix. If noxious weeds emerge on the project site areas as a result of project activities, the proponent will be required to treat and eliminate those.	MM	1/20/23

Determination	Resource/Issue	Rationale	Initial	Date
NI	Plants: Native Vegetation & Woodlands/Forestry	Less than .3% of the project areas is expected to be disturbed; the disturbance expected to native vegetation should be concentrated along travel routes due to minor construction and maintenance, such as berms, ditches and erosion control features. This resource does not require additional analysis at this time per the scope, scale and applicant committed measures as proposed.	MM	1/20/23
NP	Plants: Threatened, Endangered, Proposed, or Candidate	None present per GIS scoping report prepared on 9/24/22	MM	1/20/23
NP	Plants: BLM Sensitive	None present per GIS scoping report prepared on 9/24/22	MM	1/20/23
NI	Recreation Resources	Per GIS review, there are no developed or undeveloped recreation resources within the project area. Impacts to disbursed recreation would be minor to imperceptible due to similar disbursed recreation opportunities available in adjacent areas. Disbursed recreation activities may be present within the Project Area, but within the scope and scale of the Proposed Action impacts do not need further analysis at this time due to the reclamation standards incorporated into the proposal per 3809 regs.	DC for RL	1/20/2023

Determination	Resource/Issue	Rationale	Initial	Date
NI	Soils: Physical/Biological	The project proposes disturbance of 16.61 acres including drill pads and roads. Soil degradation is a prime impact of the Proposed Action. According to the USDA's Web Soil Survey, most of the soils in the Project Area are moderately susceptible to erosion. OSHA classified these soils as the least stable Type C: gravel, sand and loamy sand, soil from which water is freely seeping, and submerged rock that is not stable. The Storm Water Pollution Prevention Plan (SWPPP) and the H-9115-1 Primitive Road Design Handbook will implement specific BMPs to prioritize the prevention of erosion. With continuous maintenance and monitoring, these measures may be sufficient to prevent further degrading of soil resources caused by vehicle traffic associated with this operation and the effects of stormwater runoff in this erosion-prone area.	MS	01/23/23
NI	Travel Management	The Safford RMP and BLM regulations specify that access needs for mineral projects will be addressed on a case-by-case basis. Given the limited scope of the project in both area and time, it is unlikely that the project will have more than a negligible effect on travel management efforts.	DM	01/26/23
NI	Visual Resources	Per GIS review, the project area falls within a visual resource management (VRM) class IV objective. VRM Class IV provide for management activities that require major modifications of the existing character of the landscape. The level of change may be high and may dominate the view and be the major focus of viewer attention. The proposed action would conform with the visual objectives of the area and not conflict with visual management objectives.	LM	9/19/2024

Determination	Resource/Issue	Rationale	Initial	Date
NI	Wastes (hazardous/solid)	No chemicals subject to reporting under SARA Title III in an amount equal to or greater than 10,000 pounds will be used, produced, stored, transported, or disposed of annually in association with the project. Solid Wastes: Trash would be confined in a covered container and hauled to an approved landfill. Burning of waste or oil is not authorized. Human waste would be contained and be disposed of at an approved sewage treatment facility.	DC	01/20/23
NI	Water: Groundwater Quality	Deriving from samples collected and analyzed in 2016, ADEQ lists Copper Creek as impaired for five elements including Copper, Cadmium, Zinc, Selenium, and Iron. These naturally occurring elements are primarily waste products of historical mining activities within the Copper Creek Mining District. Exploration activities are not expected to significantly increase the presence of these elements in surface or groundwater. Redhawk's proposed 67 exploratory holes will likely intersect the groundwater table within the project area. The action has potential to expose groundwater aquifers to several impacts including contamination of aquifers from the discharge of process water and other effluents and by hydrocarbons and other toxins through spills or leaching sumps. The potential impacts to groundwater quality are mitigated by minimizing drilling fluids, lining sumps with impermeable materials, and using BMPs to minimize risk of impacts from hazardous products such as fuel and other petroleum products.	MS	01/23/23

Determination	Resource/Issue	Rationale	Initial	Date
NI	Water: Hydrologic Conditions (stormwater) Water: Municipal Watershed / Drinking Water Source Protection	Water seasonally enters the project area from winter rains and occasional snowmelt or from high-intensity monsoonal events in the summer and fall. Precipitation is conveyed as surface runoff and as shallow groundwater in the bedrock dominated areas of the mountain slopes and down into the unconsolidated alluvial sediments providing recharge to the Basin and Range Aquifer. Copper Creek is a tributary to the San Pedro River, their confluence is just south and upstream of the City of Mammoth, AZ. The quantity and quality of City's water supply are likely influenced by inflows from Copper Creek The proposed SWPPP is sufficient to mitigate impacts to surface and groundwater derived from stormwater and stormwater runoff.	MS	01/23/23
PI	Water: Steams, Riparian, Wetlands, Floodplains, Surface Water Quality, Fish (designated or non-designated)	Groundwater supports seep, spring, and wetland ecosystems within the project area. Although the SWPPP and the use of the H-9115-1 Primitive Road Design Handbook prioritize prevention of sedimentation due to erosion, there will likely be adverse impacts to streams, wetlands, and riparian areas. Water and habitat quality are likely to be degraded due to additional sediment loading and potentially by reduced availability of surface water.	MS	01/23/23
PI	Water: Water Rights	Changes in groundwater levels may affect the expression, availability, and/or duration of surface and/or near-surface water resources. Further, there are many private, state, and federal water rights associated with Copper Creek and the San Pedro River that could potentially be affected by water withdrawals associated with this project.	MS	01/23/23

Determination	Resource/Issue	Rationale	Initial	Date
NI	Water: Waters of the U.S.	Copper Creek is a tributary to the San Pedro River with intermittent and perennial segments. The U.S. Army Corps of Engineers (Corps) is currently working on guidance on implementation of the revised definition of Waters of the U.S. If the Corps determines that Copper Creek meets the definition of a Relatively Permanent Water under that guidance, it would be under the jurisdiction of the Clean Water Act (CWA). Compliance with the CWA will be addressed through ADEQ's Muti Sector General Permit and the SWPPP.	MS	01/23/23
PI	Wildlife: Migratory Birds (including raptors)	Per review of current SFO GIS data, AGFD HabiMap and USFWS IPaC reporting, impacts to migratory birds may occur with the implementation of the proposed action as stated by Redhawk in their exploration plan. Habitat quality has the potential to be degraded by groundwater pumping that can impact the presence, availability, and duration of surface and near-surface water resources and vegetation removal. Incorporation of environmental protection measures such as the design features discussed in Section 2.2.11 of the EA may mitigate these potential impacts to Migratory birds.	KF/HB/GB/MM	02/20/25
PI	Wildlife: Non-USFWS Designated	Impacts to game and nongame species of wildlife may occur with the implementation of the Proposed Action as stated by Red Hawk in their exploration plan. Incorporation of design feature and/or mitigation measures may limit such impacts. See chapter 3 for detailed discussion.	DC/KF/MM/HB	02/20/25
PI	Wildlife: Sensitive Species	Present (see Appendix C for determination, see chapter 3 for detailed discussion): Lowland leopard frog (*Lithobates yavapaiensis*) Townsend's big-eared bat (*Corynorhinus townsendii*) Sonora (Desert) mud turtle (*Kinosternon sonoriense sonoriense*)	MM/HB	02/20/25

Determination	Resource/Issue	Rationale	Initial	Date
PI	Wildlife: Sensitive Species	Possible (see Appendix C for determination, see chapter 3 for detailed discussion): American peregrine falcon (*Falco peregrinus anatum*) (forging only; not nesting) Desert purple martin (*Progne subis hesperia*) Ferruginous hawk (*Buteo regalis*) (forging only; not nesting) Gilded flicker (*Colaptes chrysoides*) California leaf-nosed bat (*Macrotus californicus*) Cave myotis (*Myotis velifer*) Greater western mastiff bat (*Eumops perotis californicus*) Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) Sonoran Desert tortoise (*Gopherus morafkai*) Golden eagle (*Aquila chrysaetos*) Nesting: Unlikely Foraging: Possible	MM/HB	02/20/25
NI	Wildlife: Sensitive Species	Unlikely (see Appendix C for determination): Arizona Botteri's sparrow (*Peucaea botterii arizonae*) Mexican long-tongued bat (*Choeronycteris mexicana*)	MM/HB	02/20/25
NP	Wildlife: Sensitive Species	None (See Appendix C for determination): Northern goshawk (*Accipiter gentilis atricapillus*) Desert sucker (*Pantosteus clarkii*) Longfin dace (*Agosia chrysogaster*) Sonora sucker (*Catostomus insignis*) Black-tailed prairie dog (*Cynomys ludovicianus*) Bald eagle (*Haliaeetus leucocephalus*)	MM/HB	02/20/25

Determination	Resource/Issue	Rationale	Initial	Date
PI	Wildlife: Threatened, Endangered, Proposed or Candidate	Possible (see Appendix C for determination, see chapter 3 for detailed discussion): Yellow-billed cuckoo (Western Distinct Population Segment) (*Coccyzus americanus*) Monarch butterfly (*Danaus plexippus*)	MM/HB	02/20/25
NP	Wildlife: Threatened, Endangered, Proposed or Candidate	None (see Appendix C for determination): Chiricahua leopard frog (*Lithobates chiricahuensis*) Cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) Mexican spotted owl (*Strix occidentalis lucida*) Gila chub (*Gila intermedia*) Spikedace (*Meda fulgida*) Gila topminnow (including Yaqui) (*Poeciliopsis occidentalis*) Ocelot (*Leopardus pardalis*) Huachuca water-umbel (*Lilaeopsis schaffneriana* var. *recurva*)	MM/HB	02/20/25

APPENDIX B

Drill Pad Coordinates

APPENDIX B. DRILL PAD LOCATIONS (NAD83), DIMENSIONS, AND CORRESPONDING NOTICE PAD IDENTIFICATION

EA Drill Pad ID	Notice Drill Pad ID	Dimension (ft)	Easting	Northing
BLM 01	—	60 x 60	548239	3623594
BLM 02	—	70 x 70	547813	3623439
BLM 03	—	60 x 60	548462	3623057
BLM 04	—	70 x 70	548635	3623075
BLM 05	—	60 x 60	548789	3622903
BLM 06	—	70 x 70	549131	3623604
BLM 07	Pad E	70 x 70	549256	3623431
BLM 08	—	70 x 70	549437	3623350
BLM 09	—	70 x 70	549609	3623314
BLM 10	—	60 x 60	549554	3623165
BLM 11	—	70 x 70	549371	3623129
BLM 12	Pad B	70 x 70	549226	3623281
BLM 13	—	70 x 70	548704	3623294
BLM 14	—	70 x 70	548848	3623298
BLM 15	Pad G	70 x 70	548950	3623152
BLM 16	Pad C	70 x 70	549126	3623269
BLM 17	Pad D	70 x 70	549033	3623354
BLM 18	—	70 x 70	548587	3623482
BLM 19	—	60 x 60	548467	3623553
BLM 20	—	60 x 60	548593	3623591
BLM 21	—	70 x 70	548732	3623504
BLM 22	—	70 x 70	548862	3623466
BLM 23	—	70 x 70	548894	3623570
BLM 24	—	70 x 70	548815	3623667
BLM 25	—	60 x 60	548931	3623862
BLM 26	—	60 x 60	548732	3623798
BLM 27	—	70 x 70	548805	3623883
BLM 28	—	60 x 60	549503	3624207
BLM 29	—	70 x 70	548991	3624408
BLM 30	—	60 x 60	549764	3623605
BLM 31	—	60 x 60	549786	3623468
BLM 32	—	70 x 70	549393	3623461
BLM 33	—	60 x 60	549674	3623266
BLM 34	—	70 x 70	548733	3623629
BLM 35	—	60 x 60	548693	3623213

EA Drill Pad ID	Notice Drill Pad ID	Dimension (ft)	Easting	Northing
BLM 36	—	60 x 60	548858	3623072
BLM 37	—	60 x 60	549373	3623029
BLM 38	—	60 x 60	549494	3623070
BLM 39	—	60 x 60	548584	3623367
BLM 40	—	70 x 70	548669	3623455
BLM 41	—	70 x 70	548779	3623406
BLM 42	—	70 x 70	548599	3623215
BLM 43	—	70 x 70	549034	3623489
BLM 44	—	60 x 60	549057	3623221
BLM 45	—	60 x 60	549065	3623054
BLM 46	Pad A	70 x 70	549158	3623131
BLM 47	—	60 x 60	548966	3623309
BLM 48	—	70 x 70	549310	3623250
BLM 51	—	60 x 60	549509	3623450
BLM 52	—	70 x 70	549617	3623368
BLM 53	—	60 x 60	548228	3623505
BLM 54	—	70 x 70	549275	3623535
BLM 55	—	60 x 60	548725	3624654
BLM 56	—	60 x 60	548574	3624556
BLM 57	—	60 x 60	548617	3624687
BLM 58	—	60 x 60	548557	3623140
BLM 59	—	70 x 70	547748	3624603
BLM 60	—	60 x 60	548001	3624447
BLM 61	—	60 x 60	548857	3624548
BLM 62	—	60 x 60	547030	3624760
BLM 63	—	60 x 60	547047	3624575
BLM 64	—	60 x 60	546690	3624761
BLM 67	—	60 x 60	547093	3623843
BLM 68	—	70 x 70	547377	3624329
BLM 69	—	70 x 70	547627	3624516
BLM 70	—	60 x 60	547675	3624698
BLM 71	—	60 x 60	549784	3624120

Pads in Notice Only – provided to indicate why Notice Pad IDs F, H, and I are missing from the table above.

Notice Only	Pad F	70 x 70		
Notice Only	Pad H	70 x 70		
Notice Only	Pad I	70 x 70		

APPENDIX C

Arizona Game and Fish Department Heritage Data Management System Online ERT Report

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:
Copper Creek

Project Description:
Exploration Project

Project Type:
Mining, Exploration

Contact Person:
Scott Hart

Organization:
WestLand Resources, Inc.

On Behalf Of:
PRIVATE

Project ID:
HGIS-19164

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. Arizona Wildlife Conservation Strategy (AWCS), specifically Species of Greatest Conservation Need (SGCN), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

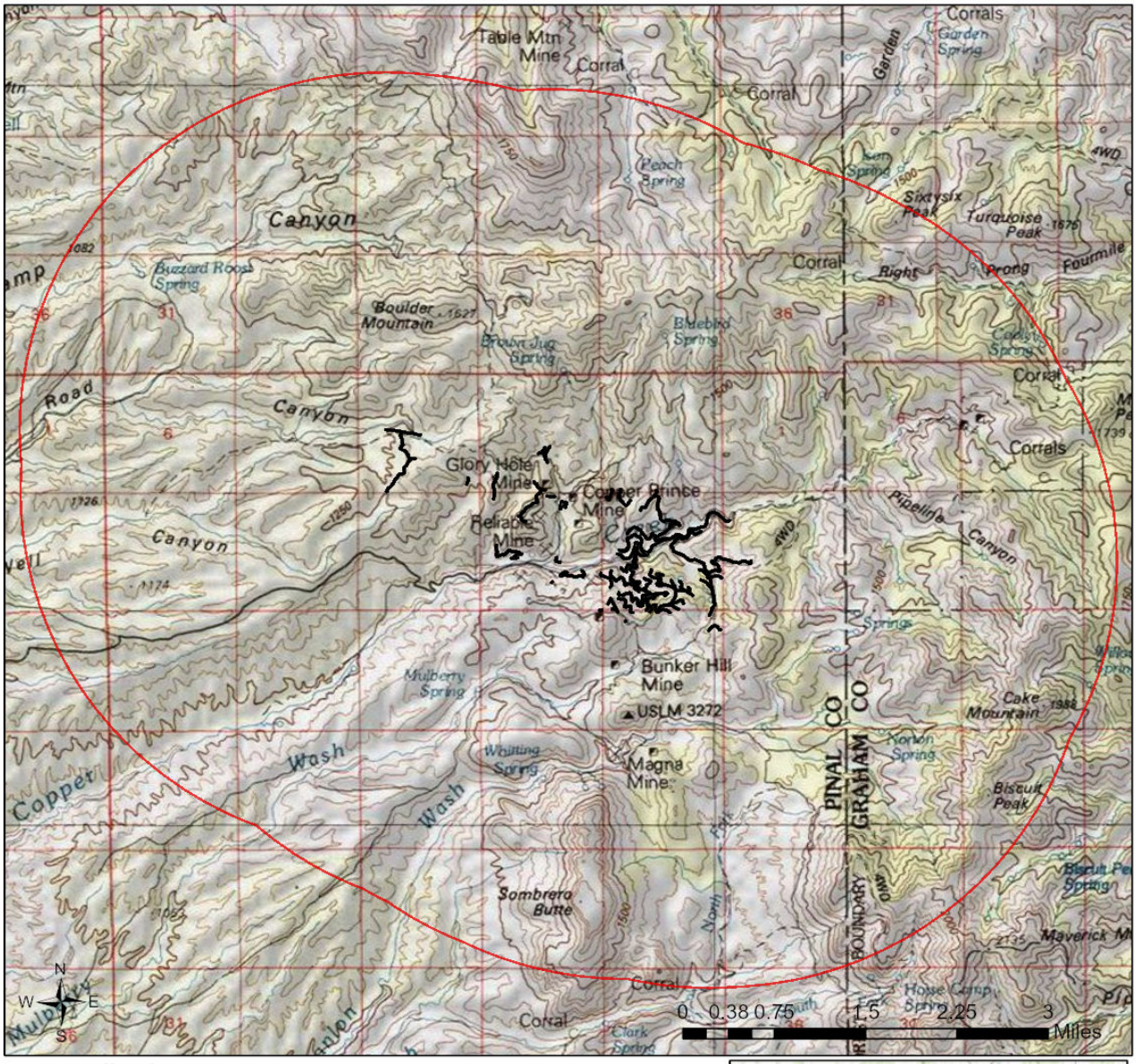
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.

Copper Creek

USA Topo Basemap With Locator Map



Buffered Project Boundary

Project Boundary

Project Size (acres): 111.72

Lat/Long (DD): 32.7513 / -110.4721

County(s): Pinal

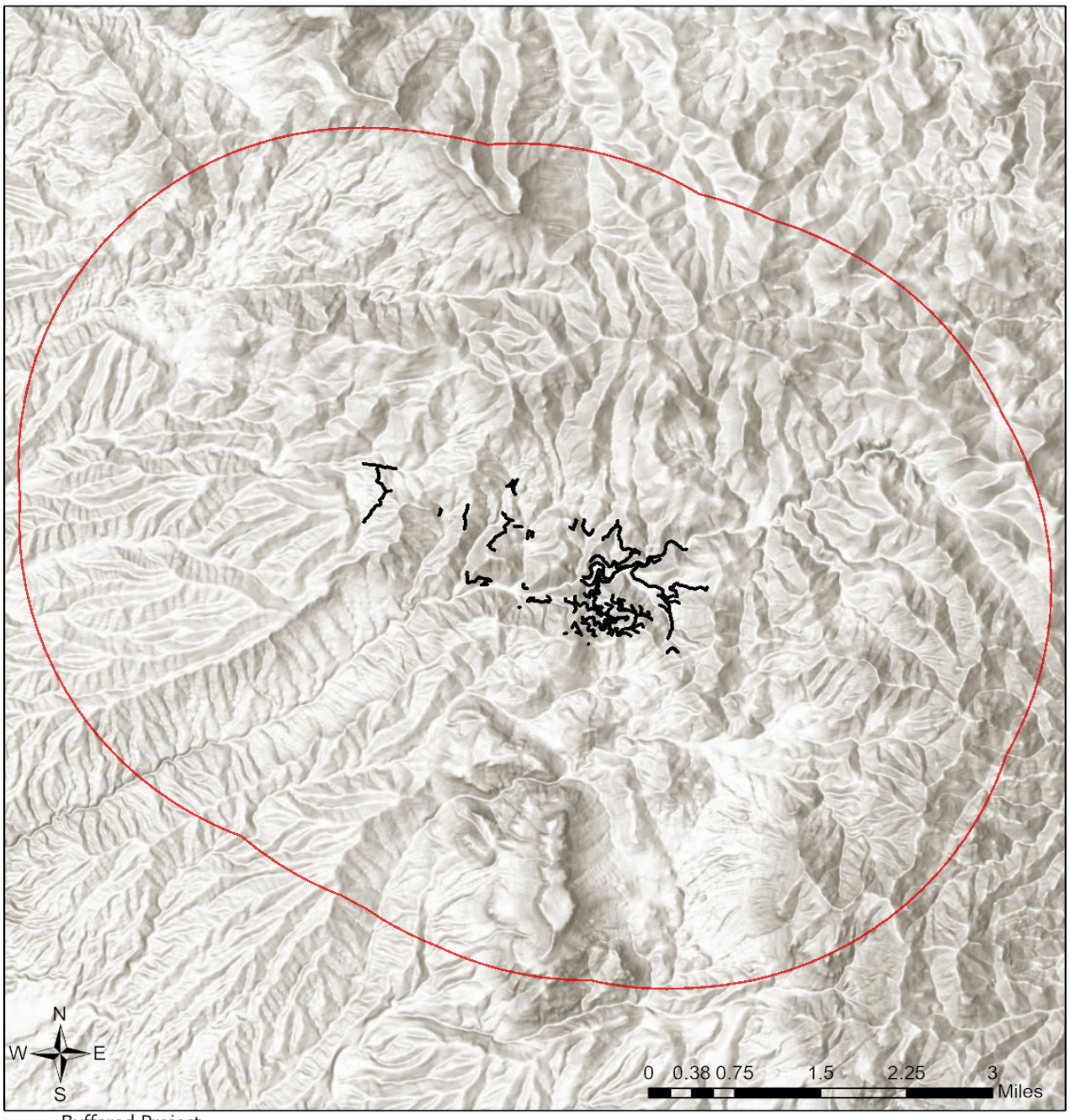
AGFD Region(s): Tucson

Township/Range(s): T8S, R18E

USGS Quad(s): HOLY JOE PEAK; OAK GROVE CANYON +

Copper Creek

Web Map As Submitted By User



Buffered Project Boundary

Project Boundary

Project Size (acres): 111.72

Lat/Long (DD): 32.7513 / -110.4721

County(s): Pinal

AGFD Region(s): Tucson

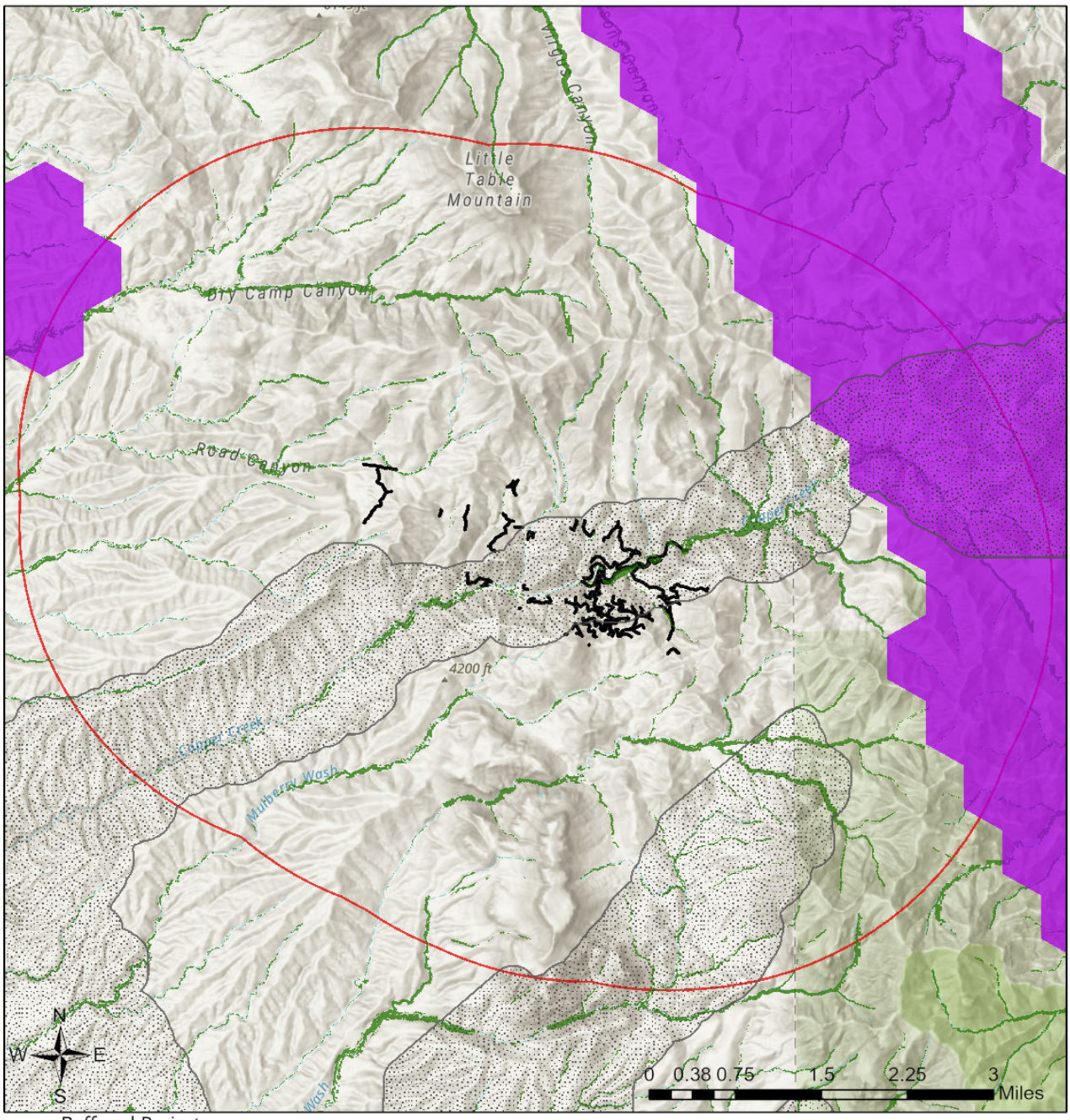
Township/Range(s): T8S, R18E

USGS Quad(s): HOLY JOE PEAK; OAK GROVE CANYON +

Esri, NASA, NGA, USGS

Copper Creek

Important Areas



- Buffered Project Boundary
- Project Boundary
- Important Bird Areas
- Critical Habitat
- Pinal County Riparian
- Important Connectivity Zones
- Wildlife Connectivity

Project Size (acres): 111.72

Lat/Long (DD): 32.7513 / -110.4721

County(s): Pinal

AGFD Region(s): Tucson

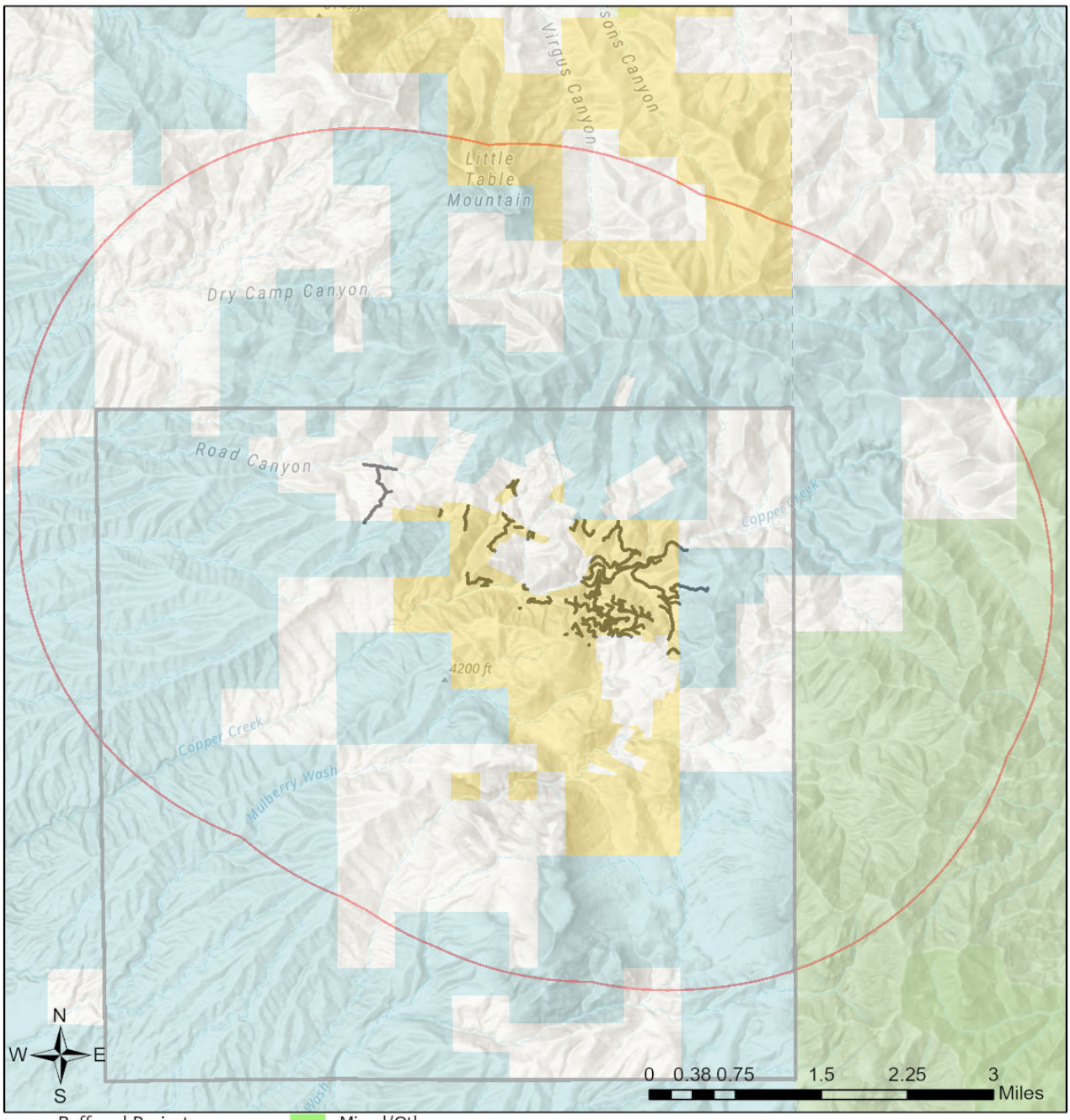
Township/Range(s): T8S, R18E

USGS Quad(s): HOLY JOE PEAK; OAK GROVE CANYON +

Esri, NASA, NGA, USGS
Esri, TomTom, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Copper Creek

Township/Ranges and Land Ownership



- Buffered Project Boundary
- Project Boundary
- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge
- Township/Ranges

Project Size (acres): 111.72

Lat/Long (DD): 32.7513 / -110.4721

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T8S, R18E

USGS Quad(s): HOLY JOE PEAK; OAK GROVE CANYON +

Special Status Species Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Rana yavapaiensis	Lowland Leopard Frog	SC	S	S		1

Note: Status code definitions can be found at https://www.azgfd.com/wildlife-conservation/on-the-ground-conservation/state-wildlife-action-plan/state-wildlife-action-plan-status-definitions/.

Special Areas Documented that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Riparian Area	Riparian Area					
Santa Catalina/Rincon - Galiuro Connectivity Assessment	Wildlife Connectivity					

Note: Status code definitions can be found at https://www.azgfd.com/wildlife-conservation/on-the-ground-conservation/state-wildlife-action-plan/state-wildlife-action-plan-status-definitions/.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Accipiter gentilis	Northern Goshawk	SC	S	S		2
Agosia chrysogaster	Longfin Dace	SC		S		2
Ammospermophilus harrisii	Harris' Antelope Squirrel					
Anthus spragueii	Sprague's Pipit	SC				2
Antrostomus ridgwayi	Buff-collared Nightjar		S			2
Aquila chrysaetos	Golden Eagle			S		2
Artemisiospiza nevadensis	Sagebrush Sparrow					
Asio otus	Long-eared Owl					2
Aspidoscelis sonorae	Sonoran Spotted Whiptail					2
Aspidoscelis stictogramma	Giant Spotted Whiptail					
Auriparus flaviceps	Verdin					2
Baeolophus ridgwayi	Juniper Titmouse					
Buteo regalis	Ferruginous Hawk	SC		S		2
Buteo swainsoni	Swainson's Hawk					2
Buteogallus anthracinus	Common Black Hawk					2
Callipepla squamata	Scaled Quail					2
Calypte costae	Costa's Hummingbird					2
Camptostoma imberbe	Northern Beardless-Tyrannulet		S			2
Campylorhynchus brunneicapillus	Cactus Wren					2
Catharus ustulatus	Swainson's Thrush					2
Catostomus clarkii	Desert Sucker	SC	S	S		2
Catostomus insignis	Sonora Sucker	SC	S	S		2
Chaetodipus baileyi	Bailey's Pocket Mouse					2
Chilomeniscus stramineus	Variable Sandsnake					2

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Choeronycteris mexicana	Mexican Long-tongued Bat	SC	S	S		2
Chordeiles minor	Common Nighthawk					2
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)					
Colaptes chrysoides	Gilded Flicker			S		2
Coluber bilineatus	Sonoran Whipsnake					2
Columbina inca	Inca Dove					2
Corvus cryptoleucus	Chihuahuan Raven					2
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1
Crotalus cerberus	Arizona Black Rattlesnake					2
Crotalus tigris	Tiger Rattlesnake					2
Cynanthus latirostris	Broad-billed Hummingbird		S			2
Cynomys ludovicianus	Black-tailed Prairie Dog	CCA		S		1
Cyrtonyx montezumae	Montezuma Quail					
Dryobates arizonae	Arizona Woodpecker		S			2
Elgaria kingii	Madrean Alligator Lizard					2
Empidonax traillii extimus	Southwestern Willow Flycatcher					
Empidonax wrightii	Gray Flycatcher					2
Eumops perotis californicus	Greater Western Bonneted Bat					
Falco mexicanus	Prairie Falcon					2
Falco peregrinus anatum	American Peregrine Falcon					
Falco sparverius	American Kestrel					2
Glaucidium gnoma californicum	Northern Pygmy-owl					
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1
Haemorhous cassinii	Cassin's Finch					2
Heloderma suspectum	Gila Monster					1
Icterus bullockii	Bullock's Oriole					2
Icterus cucullatus	Hooded Oriole					2
Incilius alvarius	Sonoran Desert Toad					2
Kinosternon sonoriense sonoriense	Desert Mud Turtle					
Lanius ludovicianus	Loggerhead Shrike	SC				2
Lasiurus blossevillii	Western Red Bat		S			2
Lasiurus cinereus	Hoary Bat					2
Lasiurus xanthinus	Western Yellow Bat		S			2
Leptonycteris yerbabuenae	Lesser Long-nosed Bat	SC				1
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1
Macrotus californicus	California Leaf-nosed Bat	SC		S		2
Megascops kennicottii	Western Screech-owl					
Melanerpes uropygialis	Gila Woodpecker					2
Melospiza lincolnii	Lincoln's Sparrow					2

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Melozone aberti	Abert's Towhee		S			2
Micrathene whitneyi	Elf Owl					
Micruroides euryxanthus	Sonoran Coralsnake					2
Myadestes townsendi	Townsend's Solitaire					2
Myotis auriculus	Southwestern Myotis					2
Myotis thysanodes	Fringed Myotis	SC				2
Myotis velifer	Cave Myotis	SC		S		2
Myotis yumanensis	Yuma Myotis	SC				2
Neotamias cinereicollis	Gray-collared Chipmunk					
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					2
Nyctinomops macrotis	Big Free-tailed Bat	SC				2
Parabuteo unicinctus	Harris's Hawk					2
Passerculus sandwichensis	Savannah Sparrow					2
Peucaea botterii arizonae	Arizona Botteri's Sparrow			S		2
Peucaea carpalis	Rufous-winged Sparrow					2
Phrynosoma solare	Regal Horned Lizard					2
Pooecetes gramineus	Vesper Sparrow					2
Progne subis hesperia	Desert Purple Martin					
Psiloscops flammeolus	Flammulated Owl					2
Sonorella galiurensis	Galiuro Talussnail					2
Spizella breweri	Brewer's Sparrow					2
Strix occidentalis lucida	Mexican Spotted Owl	LT				1
Tadarida brasiliensis	Brazilian Free-tailed Bat					
Toxostoma bendirei	Bendire's Thrasher					2
Troglodytes pacificus	Pacific Wren					2
Vireo vicinior	Gray Vireo					
Xantusia bezyi	Bezy's Night Lizard					

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Odocoileus hemionus	Mule Deer					
Odocoileus virginianus	White-tailed Deer					
Ovis canadensis mexicana	Mexicana Desert Bighorn Sheep					
Patagioenas fasciata	Band-tailed Pigeon					
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Ursus americanus	American Black Bear					
Zenaida asiatica	White-winged Dove					

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Zenaida macroura	Mourning Dove					

Project Type: Mining, Exploration

Project Type Recommendations:
Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at https://www.invasivespeciesinfo.gov/unitedstates/az.shtml and the Arizona Native Plant Society https://aznps.com/invas for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at https://imap.natureserve.org/imap/services/page/map.html.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select “See What’s Here” for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

Based on the project type entered, coordination with the Office of Surface Mining may be required (https://www.osmre.gov/).

Based on the project type entered, coordination with State Historic Preservation Office may be required (https://azstateparks.com/).

Pre- and post-survey/monitoring should be conducted to determine alternative access/exits to mines and to identify and/or minimize potential impacts to bat species. For further information when developing alternatives to mine closures, contact the Arizona Game and Fish Department Nongame Bat Coordinator at the Main Office in Terrestrial Branch, https://www.azgfd.com/agency/offices or (602) 942-3000.

Based on the project type entered, coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly at PEP@azgfd.gov.

Avoid/minimize wildlife impacts related to contacting hazardous and other human-made substances in facility water collection/storage basins, evaporation or settling ponds and/or facility storage yards. Design slopes to discourage wading birds and use fencing, netting, hazing or other measures to exclude wildlife.

Project Location and/or Species Recommendations:
Analysis indicates that your project is located in the vicinity of an identified ***wildlife habitat connectivity feature***. The **Detailed Wildlife Connectivity Assessments** represent ideal connections within or between intact blocks or core habitats. The blocks are currently disconnected or isolated and the linkages should be examined for improving permeability, or are currently intact and in need of preservation and/or enhancement. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer to: https://www.azgfd.com/wildlife/planning/habitatconnectivity/identifying-corridors/
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

This review has identified **riparian areas** within the vicinity of your project. During the planning stage of your project, avoid, minimize, or mitigate any potential impacts to riparian areas identified in this report. Riparian areas play an important role in maintaining the functional integrity of the landscape, primarily by acting as natural drainages that convey water through an area, thereby reducing flood events. In addition, riparian areas provide important movement corridors and habitat for fish and wildlife. Riparian areas are channels that contain water year-round or at least part of the year. Riparian areas also include those channels which are dry most of the year, but may contain or convey water following rain events. All types of riparian areas offer vital habitats, resources, and movement corridors for wildlife. The Pinal County Comprehensive Plan (i.e. policies *6.1.2.1* and *7.1.2.4*), Open Space and Trails Master Plan, Drainage Ordinance, and Drainage Design Manual all identify riparian area considerations, guidance, and policies. Guidelines to avoid, minimize, or mitigate impacts to riparian habitat can be found at https://www.azgfd.com/wildlife-conservation/planning-for-wildlife/planning-for-wildlife-wildlife-friendly-guidelines/.
Based on the project type entered, further consultation with the Arizona Game and Fish Department and Pinal County may be warranted.

APPENDIX D

Federally Listed, BLM Sensitive, and General Wildlife Species

APPENDIX D. FEDERALLY LISTED, BLM SENSITIVE, AND GENERAL WILDLIFE SPECIES

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1.0 SPECIAL-STATUS SPECIES SCREENING

A screening analysis was performed to evaluate the potential for Special-status Species to occur within the Project Area and to determine the presence or absence of designated or proposed critical habitat within the Project Area. These determinations were based on review of:

- The natural history and known geographical and elevational ranges of the Special-status Species.
- Results of an Arizona Game and Fish Department (AGFD) Heritage Data Management System online environmental review tool (ERT) query that provided records of Special-status Species within 3 miles of the Project Area.
- Other occurrence records in published or grey literature, including citizen science data.
- Data provided by the AGFD HabiMap online mapping system.
- Data provided by the U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal online mapping tool.
- Observations recorded during field reconnaissance of the habitats present in the Project Area. WestLand biologists visited the Project Area to conduct survey as noted above, during which vegetation and other habitat attributes within the Project Area were documented to evaluate the potential for Special-status Species to be present.

The criteria used to determine the potential of occurrence for each species included in this screening analysis are defined as follows:

Present: The species has been observed to occur within the Project Area, the Project Area is within the known range and distribution of the species, and habitat characteristics required by the species are present.

Possible: There are no known records of the species within the Project Area, but the known, current distribution of the species includes the Project Area and the required habitat characteristics of the species appear to be present in the Project Area. Given the uncertainty associated with species identification and accuracy of the location of observations from eBird and other citizen science databases, observations associated with citizen science databases are evidence that a species is possible within the Project Area.

Unlikely: The known, current distribution of the species does not include the Project Area, but the distribution of the species is close enough such that the Project Area may be within the dispersal or foraging distance of the species, and they may show up as transients; especially applicable to species that can fly. The habitat characteristics required by the species may be present in the Project Area.

None: The Project Area is outside of the known distribution of the species, or the habitat characteristics required by the species are not present.

2.0 SPECIAL-STATUS SPECIES EFFECTS ANALYSIS

2.1. EFFECTS CATEGORIES

Discrete project effects categories were used for each of the three types of Special-status Species (Endangered Species Act [ESA], Bureau of Land Management [BLM] Sensitive species, and Bald and Golden Eagle Protection Act [BGEPA]). Effects are discussed in EA Chapter 3.

ESA-Listed

A subset of the Special-status Species evaluated are listed under the ESA and effects to these species were analyzed per the following three potential effects determinations:

- **No effect**
- **May affect, not likely to adversely affect**
- **May affect, likely to adversely affect**

Species that are Candidate for ESA listing are included in this document but do not have ESA protections and are not subject to any of these formal determinations. They were instead given a determination as outlined for BLM Sensitive species (see below).

BLM Sensitive Species and ESA Candidate Species

For BLM Sensitive species and, as noted above, ESA Candidate species, effects were analyzed to determine whether the project is expected to result in the loss of viability or a trend towards listing under the ESA (**Appendix C**). Three potential effects determinations were considered:

- **No impact**
- **May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing**
- **Likely to result in a loss of viability or result in a trend toward federal listing**

BGEPA-Listed

Bald and golden eagles are protected under the BGEPA. Effects to BGEPA species were analyzed to determine whether any proposed project activities would violate the BGEPA. The BGEPA prohibits unpermitted activities to "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof of the foregoing eagles…" Under the BGEPA, "take" is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 U.S.C. 668c). Disturb is further defined as "…to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Permits may be granted for eagle takes that are "associated

with, but not the purpose of, the activity; and cannot practicably be avoided" (50 C.F.R. 22.26). Per the definition of take above, the three potential effects determinations include:

- **No take**
- **Not likely to result in take**
- **Likely to result in take**

2.2. PROJECT ACTIVITY EFFECTS

Potential effects of the project on Special-status Species, encompassing the extent of all direct effects and delayed consequences related to the project, were evaluated by considering the results of the Screening Analysis alongside the project's possible impacts from 1) surface disturbance 2) noise 3) dust 4) nighttime lighting and 5) groundwater pumping. The evaluation included consideration of design features and best management practices developed for the project.

Table 1. ESA Status Species Screening Analysis

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
AMPHIBIANS						
Lithobates chiricahuensis Chiricahua leopard frog	Threatened (USFWS 2002, USFWS 2012b); designated critical habitat (USFWS 2012b).	Breeds in perennial to semi-permanent montane aquatic environments including cattle tanks, creeks, cienegas, pools, rivers, springs, lakes and reservoirs (USFWS 2011a). Larvae are obligate on aquatic habitats whereas adults are primarily aquatic but also utilize terrestrial habitats (USFWS 2012b). May disperse from occupied habitat 1 mile overland, 3 miles along intermittent drainages, and 5 miles along permanent water courses, or some combination thereof (USFWS 2012b). Elevation: 3,200–8,890 ft (USFWS 2012b).	Occurs in Arizona and New Mexico, U.S. and Sonora, Chihuahua and Durango, Mexico (USFWS 2012b).	In Arizona, this species distribution is split into two areas, one within montane areas across the Mogollon Rim and the second in the mountains and valleys south of the Gila River (AGFD 2023c). At the time of the initial listing (USFWS 2002), the frog was likely extant at an estimated 87 localities in Arizona. Surveys between 2002 and 2009 suggest that there has been a modest increase in the number of breeding sites (USFWS 2011a).	**None** There has been widespread extirpation of Chiricahua leopard frogs from known historic locations in the Galiuro Mountains (Recovery Plan), modern surveys have found populations only on the eastern flanks of the range (Jones and Sredl 2005); the Chiricahua leopard frog Galiuro Management Area of Recovery Unit 4 (Pinaleño-Galiuro-Dragoon Mountains) includes only portions of the Galiuro Mountains on the east slope of the range south of Copper Creek (Mosley, Marsh, and Owens 2020), and presence of Lowland leopard frogs in the Project Area suggests the habitat is only marginally suitable for Chiricahua leopard frogs. In addition, the ERT (**Appendix C**) does not have any records of this species within 3 miles of the Project Area.	**No effect** This species is not expected to occur within the Project Area.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
BIRDS						
Glaucidium brasilianum cactorum Cactus ferruginous pygmy owl	Threatened (USFWS 2023)	Range-wide this species utilizes a broad range of arid to humid habitats from desertscrub to rainforest edges (Proudfoot and Johnson 2000). The *cactorum* subspecies commonly occurs in desertscrub, thornscrub, dry deciduous forests and lowland riparian habitats (USFWS 2011b). In Arizona, this species occurs in cottonwood and willow riparian habitats, mesquite bosques, heavily wooded dry washes, and suburban or rural areas with native vegetation (Corman 2005c). Nests in cavities of saguaro cacti or broad leaf riparian tree species (AGFD 2023a, Corman 2005c). This species resides in same habitat types year-round (Proudfoot and Johnson 2000). Elevation: In Arizona, historically 450–4,200 ft (Corman 2005c).	This species is non-migratory (Proudfoot and Johnson 2000). The *cactorum* subspecies ranges from southern Arizona and southern Texas, U.S. and south into Mexico. Occurs along the Pacific Slope in Sonora, Sinaloa, Nayarit, Jalisco, Colima and Michoacán and along Atlantic Slope in Nuevo Leon and Tamaulipas (USFWS 2011b). However, there is uncertainty if the Texas and Atlantic Slope population are best described as the *cactorum* or *ridgwayi* subspecies (Proudfoot and Johnson 2000, USFWS 2011b).	Modern records for this species primarily occur in Pima County including the Altar Valley, Avra Valley, Tohono O'odham tribal lands and Organ Pipe Cactus National Monument (Corman 2005c, USFWS 2011b). Additionally, this species occurs near Oracle Junction, Pinal County (Corman 2005c).	**None.** The Project Area is outside of the known distribution for this species. There are no ERT (**Appendix C**) records within 3 miles of the Project Area.	**No effect.** This species is not expected to occur within the Project Area.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
***Coccyzus americanus* (western Distinct Population Segment)** Yellow-billed cuckoo	Threatened (USFWS 2014); designated critical habitat (USFWS 2021a).	In Arizona, most common in lowland riparian woodlands where Fremont cottonwood, willow, velvet ash, Arizona walnut, mesquite, and tamarisk are dominant (USFWS 2013). Also uses drier woodlands including mesquite bosques, drainages in desert scrub and desert grassland with a tree component, and Madrean evergreen woodlands in perennial, intermittent or ephemeral drainages (USFWS 2020). They may migrate along riparian corridors and surrounding upland vegetation (Hughes 2020). Small tree stem density associated with young trees and total canopy closure at revegetation sites positively associated with nest placement; native large tree stem density had a weak positive association with nest placement; area (site size) predicts site occupancy to a lesser degree; median size of occupied sites from 2006 to 2012 was 91.9 ac, home ranges on the San Pedro River had a mean of 95.4 ac ranging from 2.5 to 556 ac, patches less than 37.1 ac were considered unsuitable on the Colorado River in Arizona and California (USFWS 2021a), and a range of 4.0 to 217.5 ac for 414 occupied sites with no detections in patches less than 4.9 ac was found in California (McNeil et al. 2013). Elevation: Typically below 6,600 ft (AGFD 2022e).	This species is a long-distance neotropical migrant (Hughes 2020). At the species level, breeds throughout temperate North America south to Mexico and the Greater Antilles (Hughes 2020). The western Distinct Population Segment (DPS) breeds west of the Continental Divide and the watershed boundary between the Rio Grande and Pecos River and the Chihuahuan Desert. The USFWS considers the historical breeding range to include southern British Columbia, Canada and in Washington, Idaho, Nevada, Oregon, Utah, western Colorado, southwestern Wyoming, California, Arizona, western New Mexico, and Texas, U.S. Breeding range extends into the Cape Region of Baja California Sur, Sonora, Sinaloa, western Chihuahua and northwestern Durango, Mexico (USFWS 2014). Winters in South America, east of the Andes and typically south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia and northern Argentina (USFWS 2014).	More common in southern, central and the extreme northeastern portion of state, but occurs throughout the state where suitable habitat exists (AGFD 2022e).	**Possible, No Potential for Breeding** See **Chapter 3 of EA** for discussion.	See **Chapter 3 of EA** for discussion.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Strix occidentalis lucida Mexican spotted owl	Threatened (USFWS 1993); designated critical habitat (USFWS 2004).	Prefers old-growth mixed conifer or pine-oak forests, or such forests with complex structure. Also uses narrow canyons with cliffs and conifer or riparian woodlands (Gutiérrez, Franklin, and Lahaye 2020). In Arizona, canyon habitats typically contain Madrean evergreen oak or Madrean pine-oak woodlands (Wise-Gervais 2005b). In forested areas, nests in large trees whereas in canyon habitats, will nest in trees, caves or on rocky ledges (USFWS 2012c). Primarily forages for rodents in a range of forest or woodland habitats, but diet also includes lagomorphs, bats, birds, reptiles, and arthropods (AGFD 2023h, Gutiérrez, Franklin, and Lahaye 2020, USFWS 2012c). This species has large home ranges, with single owls in Arizona utilizing an average of 1,600 ac and pairs an average of 2,000 ac (AGFD 2023h). Migration is variable within areas and among years (AGFD 2023h, Gutiérrez, Franklin, and Lahaye 2020). When winter movements do occur, this species may move locally, primarily to lower elevations and more open sites with pinyon pine-juniper woodlands, open mountain shrub habitat, conifer forests or deciduous riparian trees (AGFD 2023h, Gutiérrez, Franklin, and Lahaye 2020). Elevation: 2,720–10,000 ft (AGFD 2023h).	This species is primarily non-migratory, although there may be some short distance (12 to 30 miles) or altitudinal movement (Gutiérrez, Franklin, and Lahaye 2020). Occurs patchily in Colorado, Utah, Arizona, New Mexico, and western Texas. Range extends from the international border southward along the Sierra Madre Occidental and Oriental to Michoacán (Gutiérrez, Franklin, and Lahaye 2020, USFWS 2012c).	Occurs patchily in the southeastern, central, and northern portions of the state (USFWS 2012c, Wise-Gervais 2005b). Range includes the Carrizo, Chuska, Galiuro, Patagonia, Santa Teresa, Whetstone, White and Winchester mountains, along the Mogollon Rim region, Black Mesa, Tsegi Canyon, Canyon de Chelly and side drainages of the Grand Canyon (Wise-Gervais 2005b).	**None** The Project Area is within the known geographic and elevational range of this species but no suitable old-growth mixed conifer or pine-oak forests, or such forests with complex structure nesting habitat is present. The USFS Living Map of Mexican Spotted Owl Forest Habitat predicts less than 0.1% probability of suitable habitat within the Project Area (USFS 2020) Additionally, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Effect** Due to the lack of suitable habitat for this species and the lack of records within 3 miles of the Project Area, no impacts to this species are anticipated.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
FISH						
Gila intermedia Gila chub	Endangered (USFWS 2005b); designated critical habitat (USFWS 2005a). [Note: USFWS (2017a) determined that *G. nigra* and *G. intermedia* should be subsumed into *G. robusta* and intends to review the status of Gila chub.]	The species typically occurs in pools of small streams or cienegas. However, this species can also be found in larger streams. It is often found near undercut banks, overhanging vegetation, and various types of cover within the aquatic habitat (USFWS 2015a). Elevation: 2,000–5,500 ft (USFWS 2015a).	Endemic to the Gila River Basin in Arizona and New Mexico, U.S. and Sonora, Mexico (USFWS 2015a).	There are 20 known populations that occur in the following areas: five locations in the Agua Fria River Basin (Indian Creek, Larry Creek, Lousy Canyon, Silver Creek, and Sycamore/Little Sycamore creeks), three locations in the San Pedro River Basin (Hot Springs/Bass Canyon, O'Donnell Creek, and Redfield Canyon), at four locations in the Santa Cruz River Basin (Cienega Creek, Romero Canyon, Sabino Canyon, and Sheehy Spring), five tributaries in the Upper Gila River Basin (Blue River, Bonita Creek, Dix Creek, Eagle/East Eagle Creek, and Harden Cienega Creek) and four locations in the Verde River Basin (Red Tank Draw, Spring Creek and Walker Creek). This species has not been detected in the Salt River Basin since 1978 (USFWS 2015a).	**None** In the San Pedro River basin, the species was extirpated except for in Hot Springs/Bass Canyon, O'Donnell Creek, and Redfield Canyon and there are no historic records from Copper Creek. Area with surface water in Copper Creek generally lacks the cover associated with Gila chub. Furthermore, there are approximately 8 miles of ephemeral channel between the persistent water in Copper Creek and the San Pedro River and non-native fish and crayfish were observed in Copper Creek, reducing the likelihood that this species could establish in Copper Creek either naturally or through reintroduction. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Effect** This species does not occur within the Project Area.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Poeciliopsis occidentalis Gila topminnow (including Yaqui)	Endangered (USFWS 1967); no critical habitat.	Occurs in springs, cienegas, permanent and intermittent streams and the margins of large rivers. Prefers warm, shallow, and slow-moving water but can occur in lentic habitats or lotic habitats with moderate current. Additionally, favors areas with algal mats or debris along stream margins (USFWS 1998). Elevation: Below 5,000 ft (AGFD 2023e).	Occurs in the Gila, Concepción and Yaqui river basins of Arizona and New Mexico, U.S. and Sonora, Mexico (USFWS 1998, Cobble 1995).	As of 2017, there are 11 to 15 natural populations and 40 reestablished wild populations of the *occidentalis* subspecies. Within the Santa Cruz River Basin this includes Monkey Spring, Cottonwood Spring, Fresno Canyon, Coalmine Canyon, Parker Canyon, the Santa Cruz River north of Nogales, Cienega Creek at Las Cienegas National Conservation Area, Cienega Creek north of I-10. Additionally, natural populations may be present in Sonoita Creek above and below Patagonia Lake and in the Santa Cruz River at Tucson. Within the Gila River Basin natural populations are found above Coolidge Dam in Bylas Spring, Middle Spring and Salt Creek. Reestablished wild populations occur in the San Pedro River Basin, Santa Cruz River Basin and the Gila River Basin above and below the Coolidge Dam (AGFD 2018). The *sonoriensis* subspecies occurs in the extreme southeastern portion of the state in the Yaqui River Basin in the San Bernardino and Leslie Canyon Wildlife Refuges (Cobble 1995, Minckley and Marsh 2009, p. 252).	**None** In the San Pedro River basin, the species was extirpated but has been reestablished. There are no historic records from Copper Creek. Furthermore, there are approximately 8 miles of ephemeral channel between the persistent water in Copper Creek and the San Pedro River and non-native mosquito fish and crayfish were observed in Copper Creek, reducing the likelihood that this species could establish in Copper Creek either naturally or through reintroduction. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Effect** This species does not occur within the Project Area.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Meda fulgida Spikedace	Endangered (USFWS 2012a); designated critical habitat (USFWS 2012a).	Inhabits shallow riffles with sand, gravel, and rubble substrates of moderate to large perennial streams (USFWS 2012a). Elevation: 1,620–4,500 ft (AGFD 2013d).	Endemic to the Gila River Basin in Arizona and New Mexico, U.S. (USFWS 2012a).	In Arizona, the only known natural population occurs in Aravaipa Creek in Graham, and Pinal counties (AGFD 2013d, USFWS 2012a). As of 2018, in Arizona reestablished or reintroduced populations occur in Fossil Creek, Spring Creek, Hot Springs Canyon and the middle and lower Blue River (Hickerson and Robinson 2019).	**None** In the San Pedro River basin, the species was extirpated except for in Aravaipa Creek and there are no historic records from Copper Creek. As of 2018, the only other population within the basin was reintroduced to Hot Springs Canyon. Also, Copper Creek does not fit the description of a moderate to large perennial stream. Furthermore, there are approximately 8 miles of ephemeral channel between the persistent water in Copper Creek and the San Pedro River and non-native fish and crayfish were observed in Copper Creek, reducing the likelihood that this species could establish in Copper Creek either naturally or through reintroduction. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Effect** This species does not occur within the Project Area.
Rhinichthys* [=*Tiaroga*] *cobitis Loach minnow	Endangered (USFWS 2012a); designated critical habitat (USFWS 2012a).	Typically inhabits swift, small to large perennial streams where it uses interstitial spaces or lee areas of primarily cobble substrates for resting and spawning (USFWS 2012a). However, slow, silty streams are occasionally used (Minckley and Marsh 2009, p. 174). Adults are often found in areas with coarse, filamentous algae (Minckley and Marsh 2009, p. 174, USFWS 2012a). Elevation: Below 8,000 ft (USFWS 2012a).	Endemic to the Gila River Basin in Arizona and New Mexico, U.S. (USFWS 2012a).	This species is found in Apache, Gila, Graham, Greenlee, Navajo, and Pinal counties. Specifically, occurs in portions of the limited to reaches in the Blue River and its tributaries; Campbell Blue and Pace creeks, Aravaipa Creek and its tributaries; Turkey and Deer Creeks, Eagle Creek, North Fork East Fork Black River, and possibly the White River and its tributaries, and the East and North Fork White River (AGFD 2023f). Additionally, as of 2018, a stocked population has been established in Hot Springs Canyon on the Muleshoe Ranch Cooperative Management Area. Stocked populations have failed to establish in Redfield Canyon (Muleshoe Ranch), Fossil Creek and Bonita Creek (Hickerson and Robinson 2019).	**None** In the San Pedro River basin, the species was extirpated except for in Aravaipa Creek and there are no historic records from Copper Creek. As of 2018, the only other population within the basin was reintroduced to Hot Springs Canyon. Copper Creek does not meet the description of either a swift or silty stream. Furthermore, there are approximately 8 miles of ephemeral channel between the persistent water in Copper Creek and the San Pedro River and non-native fish and crayfish were observed in Copper Creek, reducing the likelihood that this species could establish in Copper Creek either naturally or through reintroduction. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Effect** This species does not occur within the Project Area.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
INSECTS						
Danaus plexippus Monarch butterfly	Proposed Threatened with a 4(d) rule; proposed critical habitat (USFWS 2024).	Monarch caterpillars feed exclusively on plants in the subfamily Asclepiadoideae (milkweed) and adults forage for nectar on a wide variety of flowers. This species can be found wherever milkweed occurs. Overwintering populations use the leaves, branches, and trunks of large trees within forested groves. In California, both native tree species and eucalyptus trees are utilized (Jepsen et al. 2015). Elevation: In Arizona, found at all elevations (Morris, Kline, and Morris 2015).	*D. plexippus* occurs in North America, Central America, the Caribbean south to South America, Hawaii, Australia, some Pacific Islands, parts of Asia, Africa, and southern Europe. Populations outside of the Americas may be non-native (Zhan et al. 2014). Most populations of the *plexippus* subspecies are migratory and breed in southern-most portions of all Canadian provinces except Newfoundland and Labrador, the conterminous U.S. states and the Mexican states of Baja California, Chihuahua, Coahuila, Nuevo Léon, Sonora, and Tamaulipas. The wintering range of migratory populations includes coastal California and southern Florida, U.S. and the Mexican states of Baja California, Mexico and Michoacán (Jepsen et al. 2015).	Breeding and migratory populations occur throughout the state. Some adults overwinter in the low deserts of Arizona in areas where food resources are abundant. These areas are generally represented by urban environments including Yuma, Phoenix and Tucson (Morris, Kline, and Morris 2015).	**Possible** See **Chapter 3 of EA** for discussion.	**May affect, /Not likely to jeopardize the continued existence.** See **Chapter 3 of EA** for discussion.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
MAMMALS						
Leopardus pardalis Ocelot	Endangered (USFWS 1982); no critical habitat.	Uses a wide range of densely vegetated habitats throughout its range including desertscrub, thornscrub, grasslands, marshlands, coastal tropical forest, dry tropical forest, tropical rain forest, oak woodlands, piedmont/montane scrub, cloud forest, pine-oak forests, palm savanna, sandhills, shrub woodlands, deciduous forest and gallery forest (AGFD 2023i, USFWS 2016). Elevation: In Arizona, generally below 4,000 ft (AGFD 2023i) but has been documented from sites as high as 9,514 ft in Mexico (USFWS 2016).	Occurs in southern Arizona and Texas, U.S. Range extends southward through Mexico to Argentina and Uruguay, South America (USFWS 2016).	Since the 1970s, six ocelots (all since 2009; five males and one unreported sex) have been documented in the Huachuca, Patagonia, Whetstone, Santa Rita mountains and Atascosa Highlands: five live and one deceased. The dead specimen of uncertain origin was found in 2010 next to a highway near Globe between the Pinal and Superstition Mountain ranges (USFWS 2018a; Tim Snow, AGFD, personal communication to D. Cerasale, WestLand Resources, June 29, 2018). A 2-year camera-trap study in the area near Globe, Arizona, did not photograph any additional ocelots (Featherstone et al. 2013). The furthest north detections of live ocelots were in the Santa Rita Mountains in 2013 and 2014; while counted as separate individuals, it is unknown if they were the same individual. An ocelot of unreported sex was recorded on a field camera in the Atascosa Highlands in June 2024 (Phoenix Zoo 2024) and the same individual was recorded again in July approximately 30 miles away across the Santa Cruz River (Center for Biological Diversity 2024), in range of the Patagonia and Santa Rita Mountains. The nearest known breeding population occurs at Rancho El Aribabi in Sonora, Mexico (Rorabaugh et al. 2020).	**None** The Project Area lacks the densely vegetated habitats normally associated with the species. Additionally, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species. The nearest observation was approximately 50 miles north of the Project Area and was of a dead ocelot found in 2010 next to a highway near Globe between the Pinal and Superstition Mountain ranges **(USFWS 2018a; Tim Snow, AGFD, personal communication to D. Cerasale, WestLand Resources, June 29, 2018)**. Within the last decade, no individuals have been observed north of Interstate 10, with the most recent sighting being in 2024 of an unreported sex ocelot observed in the in the Patagonia or Santa Rita Mountains at least 60 miles south of the Project Area. A male has been observed in the Huachuca Mountains over 85 miles south of the Project Area numerous times since 2012, last in 2021, and as of 2021 was the only known ocelot residing in Arizona (USFWS 2021b) until the 2024 individual was observed. lot residing in Arizona (USFWS 2021b).	**No effect** Due to the lack of suitable habitat needed for this species along with the limited footprint size of ground disturbance associated with the project, lack of records within 3 miles of the Project Area, and the natural rarity of the species, no impacts to this species are anticipated.

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
PLANTS						
Lilaeopsis schaffneriana* var. *recurva Huachuca water-umbel	Endangered (USFWS 1997), designated critical habitat (USFWS 1999).	Found in shallow and slow-flowing cienegas, rivers, streams and springs or within active stream channels in areas that escape scouring during flood events; depends on the availability of permanently wet (or nearly so), muddy, or silty substrates with some organic content (USFWS 2017b). Elevation: 2,001–7,100 ft (USFWS 2017b).	Occurs in southeastern Arizona, U.S. and Sonora and Chihuahua, Mexico (SEINet Portal Network 2019, accessed Janauary 11, 2019, USFWS 2017b)	Found at 17 localities within the Santa Cruz, San Pedro, and Rio Yaqui watersheds. Within the Santa Cruz River basin this species occurs at six locations including Bear Canyon, Huachuca Canyon, Las Cienegas, Scotia Canyon, Sunnyside Canyon and upper Sonoita Creek. Within the San Pedro River basin there are nine locations including the Babocomari River, Gardner Canyon, Lone Mountain Canyon, McClure Canyon, Sawmill Canyon, Sycamore Spring, Wakefield Mine springbox and the mainstem of the San Pedro River. Within the Rio Yaqui basin this species occurs in Black Draw and Leslie Canyon (USFWS 2017b).	**None** In the San Pedro River basin, the known populations do not include Copper Creek, there are no records of occurrence in Copper Creek, and the bedrock nature of Copper Creek where water persists precludes the development of the permanently wet (or nearly so), muddy, or silty substrates with some organic content the species requires. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Effect** This species is not expected to occur within the Project Area.

Table 2. Bald and Golden Eagle Protection Act Species Screening and Effects Analysis

Species Name	Federal Status	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Aquila chrysaetos Golden eagle	Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c)	Range-wide, breeds in a wide variety of open habitats, with nests typically on cliffs, and avoids heavily forested areas (Katzner et al. 2020). In Arizona, prefers pinyon-juniper woodlands and Sonoran desertscrub (Driscoll 2005). Constructs large nests on cliff ledges, rock outcrops, tall trees or, rarely, transmission towers (Driscoll 2005). Golden eagles are known to forage within 4.4 miles of the nest (Tesky 1994), generally in open habitats where prey is available (Katzner et al. 2020). Primarily feeds on small mammals (greater than 80% of prey items) but also consumes birds, reptiles and fish (Katzner et al. 2020). In the western U.S. average territory size ranges from 22 to 55 square miles (AGFD 2022d). Elevation: In Arizona, typically breeds between 1,300–9,000 ft (Driscoll 2005).	This species is a short to medium-distance partial migrant with a Holarctic distribution (Katzner et al. 2020). In North America, primarily breeds in western portion of the continent from Alaska to central Mexico. Northernmost populations are typically migratory. Year-round and non-breeding populations occur from central Saskatchewan to British Columbia, Canada and south throughout its range and sparsely in the eastern U.S. (Katzner et al. 2020).	Found in suitable habitat throughout the state (Driscoll 2005) but tend to vacate low desert areas during the summer (AGFD 2022d) .	**Nesting: Unlikely** **Foraging: Possible** Foraging habitat present, but appropriate nesting habitat in the Project Area. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Take** No project related impacts to potentially suitable nesting habitat are anticipated. Given the lack of records of this species within 3 miles of the Project Area in addition to the limited footprint size of ground disturbance associated with the project compared to the large foraging range of this species, no impacts to this species are anticipated.
Haliaeetus leucocephalus Bald eagle	Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c)	Breeding is concentrated in coastal areas, along rivers, lakes, or reservoirs. Typically breeds in forested areas with edge habitat within 1.3 miles of aquatic habitats suitable for foraging. Prefers areas of shallow water and shorelines for fishing and hunting wide variety of waterfowl, and small aquatic and terrestrial mammals. Fish are preferred prey, but carrion is used extensively whenever encountered. Nests away from human disturbance in large trees and rarely on cliff ledges or on the ground when trees are absent. Winters primarily in coastal areas or along major river systems with adequate prey availability and large trees for perching (Buehler 2020). Elevation: In Arizona, 460–7,930 ft (AGFD 2022b).	Migratory behavior varies among populations and age groups (Buehler 2020). Breeds south of the tundra throughout Canada and the U.S., excluding Hawaii. Additionally, small breeding populations occur in Baja California, Sonora and Chihuahua, Mexico (Buehler 2020). Winter range appears to be expanding as populations increase in size. Most populations are year-round residents with only the northern most populations in Alaska, U.S. and Canada withdrawing southward or to coastal areas (Fink et al. 2018).	A small resident population occupies the central part of the state, and a wintering population occurs in central and northern Arizona. Breeding territories occur at most large lakes and reservoirs and along portions of large rivers and creeks, including the Agua Fria, Bill Williams, Colorado, Little Colorado, Gila, Salt, San Carlos, San Francisco, and Verde rivers (AGFD 2022b, McCarty, Licence, and Jacobsen 2018).	**None** No appropriate habitat of surface water with available prey of fish is present in the Project Area. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No Take** Due to habitat limitations and the lack of ERT records within 3 miles of the Project Area, this species is not expected to occur within the Project Area and no impacts are anticipated.

Table 3. BLM Gila District Office Sensitive Species with AGFD Model Predicting Intersection of Habitat and Project Area

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
AMPHIBIANS					
Lithobates yavapaiensis Lowland leopard frog	Occurs in a variety of perennial to near perennial waters in desert grasslands to pinyon JUNIPER biotic communities (AGFD 2023g). Inhabits large rivers, streams, canals, cienegas, cattle tanks or other aquatic features (Rorabaugh 2008). Can survive in semi-permanent aquatic systems by retreating into deep mud cracks, mammal burrows, or rock fissures, but large pools are required for adult survival and reproductive efforts (Lower Colorado River Multi-Species Conservation Program 2016). Elevation: In Arizona, from 480–6,200 ft (AGFD 2023g).	Historic range included Arizona, California, Nevada, New Mexico, U.S. and extreme northeastern Baja California, northern Sonora, and possibly northwestern Chihuahua, Mexico (AGFD 2023g, Lower Colorado River Multi-Species Conservation Program 2016). Current range is restricted to southern Arizona and adjacent portions of Sonora (Lower Colorado River Multi-Species Conservation Program 2016).	Found in central and southeastern Arizona (AGFD 2023g). Commonly found in the interior portion of the state, south and west of the Mogollon Rim, but additional populations occur in the western Grand Canyon and the southeast (Lower Colorado River Multi-Species Conservation Program 2016).	**Present.** Lowland leopard frogs are found throughout the wetted habitat of Copper Creek.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.
BIRDS					
Falco peregrinus anatum American peregrine falcon	Breeds in a wide range of open habitats (White et al. 2002). Prefer steep cliffs that overlook woodlands and riparian areas. Habitat selection is mainly driven by the abundance of prey (birds and occasionally bats). The peregrine dives from cliffs to ambush prey. Usually forages within 9 miles of the nest site, but foraging distances of 15 miles are common (Luensmann 2010). This species can be found in less optimal habitats, such as small, broken cliffs or cliffs in xeric areas, when preferred habitat is not available. Will roost on tall buildings when prey is abundant (AGFD 2022a). In Arizona, this species is most often found in forested regions from pinyon pine-juniper and evergreen oaks to ponderosa pine and mixed conifer, to cold-temperate desertscrub and Sonoran desertscrub (AGFD 2022a, Burger 2005). Migratory and overwintering habitats are diverse and include similar habitats to those used during breeding and areas devoid of cliffs (White et al. 2002). Elevation: In Arizona, 400–9,000 ft (AGFD 2022a).	*F. peregrinus* occurs on every continent expect Antarctica (White et al. 2002). The *anatum* subspecies is a partial migrant and breeds throughout North America south of the tundra, excluding coastal Pacific Northwest, to northern Mexico (White et al. 2002). Winter range includes portions of the breeding range where prey is abundant year-round and extends south through Central America and South America through Chile (AGFD 2022a, White et al. 2002).	Breeds throughout the state wherever there is suitable habitat (AGFD 2022a, Burger 2005). Breeding densities are greatest in areas with large cliff features including the Mogollon Rim, the Grand Canyon and portions of the Colorado Plateau (AGFD 2022a). Some individuals remain near breeding territories year-round, while others move to lowlands or migrate south for the winter (AGFD 2022a, Burger 2005).	**Nesting: None** **Foraging: Possible.** The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species. The Project Area lacks nesting habitat typically associated with this species (i.e., steep cliffs, tall buildings) but there are cliffs within foraging distance and the Project Area contains suitable foraging habitat and occur within capable foraging distance from potentially occupied areas.	**No impact to breeding.** **May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for foraging discussion.

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Peucaea botterii arizonae Arizona Botteri's sparrow	The *arizonae* subspecies inhabits areas with tall, dense stands of grass, upland mesquite grassland and oak woodlands (Webb and Bock 2012). In Arizona, this species most frequently breeds in swales, floodplains and drainages dominated by sacaton grass. Often forages in adjacent grassy hillsides and slopes. Additionally, breeds in grassy upland areas with very scattered low shrubs and the transition zone between semi-dessert grassland and evergreen oak (Corman 2005a). Arizona populations are migratory and winter in habitats outside of the U.S. (Webb and Bock 2012). Elevation: In Arizona, breeds 3,550–5,200 ft (Corman 2005a).	This species is primarily non-migratory but northern most populations withdraw southward after breeding (Webb and Bock 2012). The *arizonae* subspecies breeds in Arizona and New Mexico, U.S. and Chihuahua, Durango and Sonora, Mexico. The winter range is poorly known but may include Chihuahua and Sonora (Webb and Bock 2012).	This species occurs from the Buenos Aires National Wildlife Refuge, Pima County, eastward to the San Bernardino Valley, Cochise County. Northern edge of the range includes the upper Altar Valley, the foothills of Mount Fagan and Sunizona. Common in the Sonoita Plains, east Santa Cruz and southwest Cochise Counties, and between the Santa Rita and Huachuca Mountains (Corman 2005a).	**Unlikely.** The Project Area is outside of the known distribution for this species, but it is a less common, but regular breeder in upland mesquite, grassland tobosa swales, and oak woodland. ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No impact.** This species is not expected to occur within the Project Area.
Progne subis hesperia Desert purple martin	Montane birds in Arizona have typically been attributed to the *subis* subspecies whereas birds which occur in the desert are attributed to the *hesperia* subspecies (Brown and Tarof 2013). In Arizona, the *hesperia* subspecies occurs in Sonoran desertscrub in areas of large saguaros with many cavities (Corman 2005e). However, this subspecies may nest in rock crevices when suitable cacti are absent (Brown and Tarof 2013). Will roost in cottonwood trees (Brown and Tarof 2013) and typically forages over rivers, lakes, ponds, and earthen stock tanks, often at considerable distances from nest sites (Corman 2005e). Elevation: In Arizona, desert birds breed between 1,800–4,060 ft (Corman 2005e).	This species is a long-distance neotropical migrant (Brown and Tarof 2013). The *hesperia* subspecies breeds in Arizona and New Mexico, U.S. and the Mexican states of Baja California, Baja California Sur, south-central Sonora, and possibly extreme northern Sinaloa. The winter range of the *hesperia* subspecies is unknown (Brown and Tarof 2013).	The *hesperia* subspecies breeds in saguaro associations throughout the south-central portion of the state, primarily east of the Baboquivari Mountains and south of the Boyce Thompson Arboretum in Pinal County (Corman 2005e).	**Possible.** The AGFD modeled the range for the Desert purple martin, which is predicted to intersect with the Copper Creek footprint. This species may forage along Copper Creek within the Project Area; however, there are no ERT records within 3 miles of this area.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.**

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Buteo regalis Ferruginous hawk	Range-wide, this species breeds in flat or rolling terrain in grassland or shrub-steppe habitats including agricultural lands, sagebrush, saltbush-greasewood shrubland and the edges of pinyon-juniper woodlands or other forest types. Nests are located on prominent landscape features such as isolated trees, electrical transmission towers or the tops of cliffs. Wintering habitat includes grasslands or desert areas where small mammal or lagomorph prey are abundant (Ng et al. 2017). In Arizona, this species breeds in cold-temperate grasslands, plains grasslands, sagebrush deserts and open pinyon pine-juniper woodlands (Corman 2005b). During migration, this species likely uses habitats similar to those used for breeding or wintering (Ng et al. 2017). In Arizona, this species winters in agricultural areas throughout the state (AGFD 2022c). Elevation: In Arizona, 3,500–6,000 ft (AGFD 2022c).	This species is a medium to short-distance migrant (Ng et al. 2017). Breeds in Alberta, Saskatchewan and Manitoba, Canada and the U.S. states of Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming. Winters in the U.S. states of Arizona, California, Kansas, Nebraska, Nevada, New Mexico, Oklahoma, Texas, Utah and Wyoming and the Mexican states of Baja California, Chihuahua, Coahuila, Durango and Sonora (Ng et al. 2017).	Found year-round in with areas of native grasslands or agricultural fields (AGFD 2022c) and breeds in the northern portion of the state (Corman 2005b).	**Nesting: None** **Non-breeding: Possible.** The Project Area is outside the known breeding range for the species (Corman and Wise-Gervais 2005). Suitable foraging habitat during non-breeding season for this species is located within the Project Area; however, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No impact to breeding.** **May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for foraging discussion.
Colaptes chrysoides Gilded flicker	This species is most common in areas with dense saguaro or Mexican giant cardon where they excavate cavities for nesting (Moore, Pyle, and Wiebe 2017). In Arizona, it primarily nests in Sonoran Desert uplands, but also occurs at reduced numbers in Sonoran Desert lowlands. Occasionally nests in cottonwood and willow riparian woodlands or dry washes; however, when cacti are available for nesting these species, riparian habitats are more typically used for foraging. Typically avoids urban and rural neighborhoods, even when saguaros are present (Corman 2005d). This species hybridizes with the Northern Flicker (Wiebe and Moore 2017). Hybrids are typically found in riparian woodlands at the upper end of the species' elevational range (Corman 2005d). This species is non-migratory and uses similar habitats year-round (Moore, Pyle, and Wiebe 2017). Elevation: In Arizona, typically 200–3,200 ft but occasionally up to 4,600 ft in riparian areas (Corman 2005d).	This species is non-migratory (Moore, Pyle, and Wiebe 2017). Occurs in Arizona, California and Nevada, U.S. and the Mexican states of Baja California, Baja California Sur, Sinaloa and Sonora (Moore, Pyle, and Wiebe 2017).	Found very locally in the Mojave Desert north of the Colorado River west of Grand Wash Cliffs and in the Detrital Valley. The species is found more commonly south of Oatman through the Sonoran Desert to the southwestern corner of the state and eastward to the San Pedro River. Occurs sparingly in the upper Gila River drainage eastward to approximately Safford. The northern border of the range in Arizona extends through the Salt River drainage to the White Mountain Apache tribal lands, up the Verde River drainage to near the confluence with Fossil Creek (Corman 2005d).	**Possible.** The Project Area is outside of the known typical elevation range of this species, but it has been recorded at higher elevations. The riparian habitat necessary for higher elevation populations is marginal. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.**

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Accipiter gentilis atricapillus Northern goshawk	Breeds in old growth deciduous, coniferous or mixed forests. The most suitable areas have high canopy cover and open understories (Squires and Reynolds 1997). In Arizona, most commonly breeds in ponderosa pine forests but is also found in mixed-conifer, ponderosa pine-Gambel's oak, Madrean pine-oak woodland habitats (Wise-Gervais 2005a). Forages on a variety of prey types (birds, small mammals, etc.) that are spotted from perches (AGFD 2013c) in a range of habitats from sagebrush to dense forest, including riparian areas (Squires and Reynolds 1997). Migratory and wintering habitat is poorly known. However, during the winter this species has been documented to use cottonwood riparian forests, aspen groves, spruce-fir forests, pine forests and open habitats (Squires and Reynolds 1997). Elevation: In Arizona, 4,750–9,120 ft (AGFD 2013c).	This species is a partial migrant that breeds throughout the Holarctic region wherever suitable habitat exists (Squires and Reynolds 1997). In the U.S., breeds in Alaska, Arizona, California, Colorado, Connecticut, Idaho, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin and Wyoming (Squires and Reynolds 1997). Winter range is as per the breeding range and irregularly south (AGFD 2013c). The *atricapillus* subspecies occurs throughout North America expect in areas occupied by other subspecies (i.e., insular British Columbia and coastal and insular Alaska).	Found in most of the high elevation, heavily forested regions of the state (Wise-Gervais 2005a). One of the highest breeding densities known is on the Kaibab Plateau (AGFD 2013c). Most individuals are residents but may move to lower elevations during the winter (Wise-Gervais 2005a). Within the state, two subspecies potentially occur, atricapillus and apache (Squires and Reynolds 1997). The apache subspecies is controversial, but as described, it occurs in the southern portion of the state (Squires and Reynolds 1997).	**None.** The Project Area is outside of the known distribution for this species. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species	**No impact.** This species is not expected to occur within the Project Area.
FISH					
Catostomus clarkii Desert sucker	Typically occurs in flowing pools and rapids of small to medium sized creeks, streams and canals (AGFD 2002b, Desert Fishes Team 2004). Prefer river bottoms of rubble with sandy silt in the interstices. Live in pools as adults and move to swift runs to feed on diatoms and algae. Young stay in riffles and feed on midge larvae (AGFD 2002b). This species either avoids or cannot persist in reservoirs or lakes (Minckley and Marsh 2009). Can tolerate high water temperatures but is less tolerant of low dissolved oxygen levels than other native fish (AGFD 2002b). Elevation: 480–8,840 ft (AGFD 2002b).	Occurs in Arizona, southeastern Nevada, west-central New Mexico and southwestern Utah, U.S. and northern Sonora, Mexico (NatureServe and Lyons 2019b).	Found in the lower Colorado River downstream of the Grand Canyon, and in the Bill Williams, Salt, Gila, and San Francisco river drainages (AGFD 2002b), including Aravaipa Creek (AGFD 2017).	**None.** Copper Creek is a small stream with limited suitable habitat for the Desert sucker. Robust populations of this species can be found in Aravaipa Creek, Hot Springs Canyon, and Redfield Canyon, all tributaries to the San Pedro River. The likelihood of Desert Sucker establishing a population in Copper Creek is low, due to the presence of predatory fish species in the San Pedro River and the lower 8 miles of Copper Creek being ephemeral.	**No impact.** This species does not occur within the Project Area.

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Agosia chrysogaster Longfin dace	Found in a variety of aquatic habitats in medium to small streams and creeks that can vary from low-elevation sandy bottomed desert streams to cool to clear mountain streams. During low water, may take refuge in moist detritus and algal mats. It is tolerant of high temperatures and low dissolved oxygen (AGFD 2013b). Can crowd in intermittent pools during drying periods (Minckley and Marsh 2009). Elevation: Typically, below 4,900 ft but there are records to 6,700 ft (AGFD 2013b, 2013e).	AGFD recognizes subspecies. The c*hrysogaster* subspecies occurs in Arizona and New Mexico, U.S. and Sonora, Mexico (AGFD 2013b, BISON-M 2018). Subspecies 1 occurs in Arizona, U.S. and Sonora, Mexico (AGFD 2013e).	The *chrysogaster* subspecies occurs primarily in the Gila and Bill Williams River basins. Introduced to, but not considered established, in the Virgin River basin (AGFD 2013b). Since 2007, this species has been introduced into Fresno Canyon, Arnett Creek, Telegraph Canyon, Rock Creek, Spur Cross Ranch Solar Oasis Pond and Fossil Creek (Hickerson and Robinson 2019). Subspecies 1 occurs in the Yaqui River Basin in the San Bernardino National Wildlife Refuge (NWR), Leslie creek in Leslie Canyon NWR, the Willcox Playa and tributaries including Turkey Creek and Rucker Creek (AGFD 2013e). Also found in Aravaipa Creek (AGFD 2017)	**None.** Copper Creek is a small stream with limited suitable habitat for the Longfin dace. Robust populations of this species can be found in Aravaipa Creek, Hot Springs Canyon, and Redfield Canyon, all tributaries to the San Pedro River. The likelihood of Longfin dace establishing a population in Copper Creek is low, due to the presence of predatory fish species in the San Pedro River and the lower 8 miles of Copper Creek being ephemeral.	**No impact.** This species does not occur within the Project Area.
Catostomus insignis Sonora sucker	Occurs in small to moderate sized streams and rivers but does not persist in impoundments (Desert Fishes Team 2004). Prefers deep, quiet waters with gravelly or rocky bottoms. Adults remain under cover during the day and move to runs and riffles at night. Young occur in runs and quiet eddies throughout the day and night (AGFD 2002c). Spawns in areas with shallow riffles (Minckley and Marsh 2009). Elevation: 1,210–8,730 ft (AGFD 2002c).	Occurs in Arizona and New Mexico, U.S. and in northern Sonora, Mexico (AGFD 2002c, NatureServe and Lyons 2019a).	Endemic to the Bill Williams and upper Gila River Basin. Never reported from the Gila River downstream of the Phoenix area (Minckley and Marsh 2009). AGFD (2002c) indicates that this species is rare to absent in the Salt River Basin although Holderman (2016) considers this species to be present in the Salt River.	**None.** Copper Creek is a small stream with limited suitable habitat for the Sonora sucker. Robust populations of this species can be found in Aravaipa Creek, Hot Springs Canyon, and Redfield Canyon, all tributaries to the San Pedro River. The likelihood of Sonora sucker establishing a population in Copper Creek is low, due to the presence of predatory fish species in the San Pedro River and the lower 8 miles of Copper Creek being ephemeral.	**No impact.** This species does not occur within the Project Area.

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
MAMMALS					
Cynomys ludovicianus Black-tailed prairie dog	Prefer sites with grass less than 30 cm tall in dry, flat areas of desert grasslands and plains. Forage on a wide variety of vegetation including grasses, weeds, and shrubs but prefer forbs. Excavate burrows in fine to medium textured soils that are readily detected due to large soil mounds surrounding the entrances (AGFD 2013a). Often associated with disturbed sites such as those heavily used by cattle (Cassola 2016). Elevation: 2,300–7,200 ft (AGFD 2013a).	Occurs in Saskatchewan, Canada and Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming, U.S. Range extends into the Mexican states of Chihuahua and Sonora (Cassola 2016).	Natural populations were extirpated by 1961. Recent reintroductions have occurred in La Cienegas Nation Conservation Area (AGFD 2013a). Four small colonies existed in the area as of 2012 at Cieneguita, Gardner Canyon, Mud Springs and Road Canyon (Hale, Koprowski, and Hicks 2013). There are planned reintroductions within the historic range of Cochise, Graham, Pima and Santa Cruz counties (AGFD 2013a). Press reports indicate that this species has also been reintroduced to Sands Ranch, which occurs between La Cienegas and the Whetstone Mountains (Arizona Daily Star 2017, Walton 2017).	**None.** The Project Area is outside of the known distribution for this species. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**No impact.** This species is not expected to occur within the Project Area.
Macrotus californicus California leaf-nosed bat	Typically forages along washes within 6.2 miles of their roost sites (Brown 2005). Primarily consumes insects but also consumes fruits (AGFD 2023b, Brown 2005). In Arizona, this species is a year-round resident of Sonoran Desertscrub. Consumes primarily insects taken on the wing or gleaned from vegetation, but have also been reported to feed on fruits, including those of cacti. Roost sites have large areas of ceiling and flying space, and include abandoned underground mines, caves, and rock shelters (AGFD 2023b). Elevation: In Arizona, below 4,000 ft (AGFD 2023b).	Occurs in Arizona, California, Nevada and Utah, U.S. and the Mexican states of Baja California, Baja California Sur, Chihuahua, Sinaloa, Sonora and Tamaulipas (AGFD 2023b, Hammerson 2015a).	Occurs below the Mogollon Rim, with occurrence records concentrated in western portion of the state (AGFD 2023b).	**Possible.** Suitable roosting habitat, including abandoned mines is present within the Project Area; however, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.
Myotis velifer Cave myotis	Forages in desertscrub vegetation and is tolerant of high temperatures and low humidity. Roosts in caves, tunnels, abandoned underground mines, buildings and under bridges within a few miles of water. In Arizona, hibernation roosts are in wet mine tunnels above 6,000 ft (AGFD 2002a). Elevation: 300–8,800 ft (AGFD 2002a).	Occurs in Arizona, California, Kansas, Nevada, New Mexico, Oklahoma, Texas and Utah, U.S. Range extends southward through Mexico to Honduras (AGFD 2002a, Hammerson 2015b).	Found primarily south of the Mogollon Rim, except for the extreme southwestern portion of the state. Small numbers of this species overwinter in southeastern Arizona, but most of the population probably migrates further south (AGFD 2002a, Hoffmeister 1986, p. 72-74).	**Possible.** Suitable roosting habitat, including abandoned mines is present within the Project Area; however, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See Chapter 3 of EA for discussion.

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Eumops perotis californicus Greater western mastiff bat	This species is found in areas with cliffs, which are used for roosting, in desert scrub, chaparral, oak woodland, ponderosa pine belt, mixed conifer forests and high elevation meadows (Siders and Pierson 2005). Maternity roosts occur in exfoliating rock slabs, crevices in boulders and buildings (Siders and Pierson 2005). The morphology of this species prevents it from drinking from water sources less than 98 ft in length and the availability of water limits its distribution across the landscape (AGFD 2014). In Arizona, this species is a year-round resident that occurs in rocky canyons with abundant roosting crevices. Forages widely from roost sites in lower and upper Sonoran desertscrub near cliffs (AGFD 2014) and has been captured more than 18 miles from roost sites (Siders and Pierson 2005). Elevation: In Arizona, 240–8,475 ft (AGFD 2014).	Occurs in Arizona, California, Nevada, New Mexico, Texas and Utah, U.S. and the Mexican states of Baja California, Chihuahua, Coahuila, Durango, Sinaloa, Sonora and Zacatecas (AGFD 2014, Hammerson 1994, Siders and Pierson 2005).	Found in all counties except Yavapai, Navajo, Apache, and Santa Cruz (AGFD 2014).	**Possible.** Suitable roosting habitat, including abandoned mines is present within the Project Area; however, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species. Additionally, in Arizona, this species is rare and found in low densities.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Leptonycteris curasoae yerbabuenae [Note: This taxa has been elevated to full species status as *L. yerbabuenae* (ITIS 2019, accessed December 2, 2019)]. [1] Lesser long-nosed bat	Occurs in thornscrub or Sonoran desertscrub and through semi-desert grasslands and into oak woodlands or deciduous forest where columnar cacti and agaves are present (AGFD 2011, Medellín 2016). Roosts in caves, abandoned mines, vegetation and occasionally old buildings (AGFD 2011, USFWS 2018c). Forages at night on nectar and pollen of columnar cacti and agaves (AGFD 2011, USFWS 2018c). In some portions of its range, fruits of cacti are commonly consumed. Additionally, this species readily finds and utilizes hummingbird feeders. Sometimes bypass foraging areas close to roost sites in favor of distant areas and have been documented travelling greater than 40 miles from known roosts. In Arizona, this species has been documented between 1,200 ft and 7,300 ft amsl but is most commonly encountered below 5,500 ft in elevation (AGFD 2011). The Arizona population is migratory, arriving in early April to give birth to young and migrating south at the beginning of September and into October (USFWS 2018c). Elevation: In Arizona 1,200 – 7,300 ft., usually below 5,500 ft. (AGFD 2011). Range-wide, it has been reported as high as 8,530 ft but is typically found below 5,905 ft (Medellín 2016).	In the U.S.: southern Arizona and extreme southwestern New Mexico. Outside the U.S.: south from the U.S. border through Mexico (including Baja), Guatemala, El Salvador, and Honduras (NatureServe 2020, accessed May 7, 2020). Note that USFWS (2018c) indicates that the range outside of the U.S. only extends as far south as southern Mexico.	Occurs from the Phoenix area and the Pinaleño Mountains southwest to Agua Dulce Mountains and southeast to the Galiuro and Chiricahua Mountains (AGFD 2011). Primarily occurs south of the Gila River (USFWS 2018c).	**Possible.** Suitable roosting habitat, including abandoned mines is present within the Project Area; however, the ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.
Choeronycteris mexicana Mexican long-tongued bat	Roosts in caves, abandoned mines, and shallow rock shelters. Prefers canyon areas with mixed oak-conifer vegetation adjacent to desert grasslands. This species forages on nectar, pollen, possibly insects, and occasionally feeds on the fruit of columnar cacti. They especially prefer to feed on flowers of paniculate agaves (AGFD 2006). Additionally, uses hummingbird feeders and ornamental plantings in residential areas (Noel and Cryan 2005). Elevation: In Arizona, 2,540–7,320 ft but most common 4,000–6,000 ft (AGFD 2006).	Occurs in southern California, southern Arizona, southwestern New Mexico and southern Texas, U.S. The range extends southward through Mexico to El Salvador and Honduras (Noel and Cryan 2005).	Found in the Chiricahua, Santa Catalina, and Baboquivari mountains (AGFD 2006) and northward to the Boyce Thompson Arboretum near Superior (AGFD personal communication to G. Diamond (WestLand), July 11, 2019).	**Unlikely.** The Project Area is near the fringe of the known distribution for this species. The ERT (**Appendix C**) has no records of occurrence within 3 miles of the Project Area for this species	**No impact.** This species is not expected to occur within the Project Area.

[1] Delisted due to recovery (USFWS 2018b).

Species Name	Known Suitable Habitat	Total Range	Distribution in Arizona	Potential to Occur	Effects Determination
Corynorhinus townsendii Townsend's big-eared bat	Forages in edge habitats along streams and adjacent to or within a variety of wooded habitats. Roosts in cliffs, caves and mines. Has a large home range and foraging distances (up to 93 miles) (Sherwin and Piaggio 2005). Elevation: Below 10,830 ft (Hammerson 2014).	Occurs from southern British Columbia, Canada and south through all western U.S. states eastward to the Black Hills of South Dakota and the Edwards Plateau in Texas. Isolated populations also exist in Oklahoma, Kansas, Arkansas, Missouri, Illinois, Indiana, Ohio, Kentucky, Virginia, and West Virginia. Range extends to the Isthmus of Tehuantepec, Mexico (Hammerson 2014).	Found throughout Arizona (Hoffmeister 1986).	**Present.** Suitable roosting habitat, including abandoned mines is present within the Project Area, and individuals were observed during field reconnaissance.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.
REPTILES					
Kinosternon sonoriense sonoriense Sonora (Desert) mud turtle	Inhabits springs, rocky streams, creeks, ponds, cattle tanks, cienegas, ditches and rivers in upland biotic communities ranging from Sonoran desertscrub to pine-oak woodland (AGFD 2023d, Brennan 2008, Rorabaugh 2019). This species is associated with perennial water, including pools in intermittent streams (Rorabaugh 2019). During wet periods, individuals may occasionally occur in upland habitats during movement between aquatic features (Rorabaugh 2019). This species may aestivate for several months in upland habitats (Rorabaugh 2019). High elevation populations are typically inactive during the winter months, but low elevation populations may remain surface active during this period (Rorabaugh 2019). Elevation: Below 6,700 ft (AGFD 2023d).	Occurs in Arizona and New Mexico, U.S. and the Mexican states of Chihuahua and Sonora (van Dijk 2011).	Found in Gila River Basin (including the Salt River) in the central and southeastern portion of the state, the Big Sandy River and Burro Creek in the Bill Williams River Basin in the west-central portion of the state, and the Lower Colorado River in the Laguna Dam area (AGFD 2023d, Brennan 2008).	**Present.** Confirmed in Upper Copper Creek during site visits in 2012 (WestLand 2012).	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.
Gopherus morafkai Sonoran desert tortoise	Found on rocky slopes and bajadas in the Mohave and Sonoran desertscrub biotic communities. Burrow in loose soil, below rocks and boulders, or find shelter under vegetation and in caliche caves. Most commonly found in association with paloverde and mixed cacti. Forage on annual and perennial grasses, forbs, succulents, trees and shrubs, and woody vines (AGFD 2023j, USFWS 2015b). In the contact zone between the species (i.e., the Black Mountains), G. morafkai generally is found in foothills, on hillside slopes and more mountainous terrain than G. agassizii that is typically found on alluvial fans and valley bottoms (Edwards et al. 2015). Elevation: 510–5,300 ft (AGFD 2023j).	Occurs in Arizona, U.S. and Sonora, Mexico (Edwards et al. 2015, Murphy et al. 2011).	Found south and east of the Colorado river in all counties except Apache, Coconino, Greenlee and Navajo (AGFD 2023j, USFWS 2015b) The southern Black Mountains are a contact zone between the Sonoran and Mojave tortoise, although the Mojave lineage predominates in the area (Edwards et al. 2015, USFWS 2015b).	**Possible.** The AGFD considers the western and southwestern ends of the project area as occupied tortoise habitat. Suitable habitat for this species includes rocky slopes. The AGFD and BLM documented tortoise scat and a shelter at the lower reaches of Copper Creek road, confirming presence of tortoises.	**May impact individuals, but unlikely to result in a loss of viability or result in a trend toward federal listing.** See **Chapter 3 of EA** for discussion.

Table 4. Species of Economic and Recreational Importance (Game Species) Predicted to Intersect the Copper Creek Project Footprint

Common Name	Scientific Names
Callipepla gambelii	Gambel's Quail
Odocoileus hemionus	Mule Deer
Odocoileus virginianus	White-tailed Deer
Ovis canadensis mexicana	Mexicana Desert Bighorn Sheep
Patagioenas fasciata	Band-tailed Pigeon
Pecari tajacu Javelina	Javelina
Puma concolor	Mountain Lion
Ursus americanus	American Black Bear
Zenaida asiatica	White-winged Dove
Zenaida macroura	Mourning Dove

Table 5. Nongame Wildlife Species with Modeled Range Predicted to Intersect the Copper Creek Footprint

Common Name	Scientific Names
Ammospermophilus harrisii	Harris' Antelope Squirrel
Anthus spragueii	Sprague's Pipit
Antrostomus ridgwayi	Buff-collared Nightjar
Artemisiospiza nevadensis	Sagebrush Sparrow
Asio otus	Long-eared Owl
Aspidoscelis sonorae	Sonoran Spotted Whiptail
Aspidoscelis stictogramma	Giant Spotted Whiptail
Auriparus flaviceps	Verdin
Baeolophus ridgwayi	Juniper Titmouse
Buteo swainsoni	Swainson's Hawk
Buteogallus anthracinus	Common Black Hawk
Callipepla squamata	Scaled Quail
Calypte costae	Costa's Hummingbird
Camptostoma imberbe	Northern Beardless-Tyrannulet
Campylorhynchus brunneicapillus	Cactus Wren
Catharus ustulatus	Swainson's Thrush
Chaetodipus baileyi	Bailey's Pocket Mouse
Chilomeniscus stramineus	Variable Sandsnake
Chordeiles minor	Common Nighthawk
Coluber bilineatus	Sonoran Whipsnake
Columbina inca	Inca Dove
Corvus cryptoleucus	Chihuahuan Raven
Crotalus cerberus	Arizona Black Rattlesnake
Crotalus tigris	Tiger Rattlesnake
Cynanthus latirostris	Broad-billed Hummingbird
Cyrtonyx montezumae	Montezuma Quail
Dryobates arizonae	Arizona Woodpecker

Common Name	Scientific Names
Elgaria kingii	Madrean Alligator Lizard
Empidonax wrightii	Gray Flycatcher
Eumops perotis californicus	Greater Western Bonneted Bat
Falco mexicanus	Prairie Falcon
Falco peregrinus anatum	American Peregrine Falcon
Falco sparverius	American Kestrel
Glaucidium gnoma californicum	Northern Pygmy-owl
Gopherus morafkai	Sonoran Desert Tortoise
Haemorhous cassinii	Cassin's Finch
Heloderma suspectum	Gila Monster
Icterus bullockii	Bullock's Oriole
Icterus cucullatus	Hooded Oriole
Incilius alvarius	Sonoran Desert Toad
Kinosternon sonoriense sonoriense	Desert Mud Turtle
Lanius ludovicianus	Loggerhead Shrike
Lasiurus blossevillii	Western Red Bat
Lasiurus cinereus	Hoary Bat
Lasiurus xanthinus	Western Yellow Bat
Megascops kennicottii	Western Screech-owl
Melanerpes uropygialis	Gila Woodpecker
Melospiza lincolnii	Lincoln's Sparrow
Melozone aberti	Abert's Towhee
Micrathene whitneyi	Elf Owl
Micruroides euryxanthus	Sonoran Coralsnake
Myadestes townsendi	Townsend's Solitaire
Myotis auriculus	Southwestern Myotis
Neotamias cinereicollis	Gray-collared Chipmunk
Nyctinomops femorosaccus	Pocketed Free-tailed Bat
Nyctinomops macrotis	Big Free-tailed Bat
Parabuteo unicinctus	Harris's Hawk
Passerculus sandwichensis	Savannah Sparrow
Peucaea carpalis	Rufous-winged Sparrow
Phrynosoma solare	Regal Horned Lizard
Pooecetes gramineus	Vesper Sparrow
Progne subis hesperia	Desert Purple Martin
Psiloscops flammeolus	Flammulated Owl
Sonorella galiurensis	Galiuro Talussnail
Spizella breweri	Brewer's Sparrow
Tadarida brasiliensis	Brazilian Free-tailed Bat
Toxostoma bendirei	Bendire's Thrasher
Troglodytes pacificus	Pacific Wren
Vireo vicinior	Gray Vireo
Xantusia bezyi	Bezy's Night Lizard

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APPENDIX E

U.S. Fish and Wildlife Service Information for Planning and Consultation Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
Phone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer To: 04/11/2024 17:10:17 UTC
Project Code: 2022-0090923
Project Name: Copper Creek

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The Fish and Wildlife Service (Service) is providing this list under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The list you have generated identifies threatened, endangered, proposed, and candidate species, and designated and proposed critical habitat, that *may* occur within the One-Range that has been delineated for the species (candidate, proposed, or listed) and it's critical habitat (designated or proposed) with which your project polygon intersects. These range delineations are based on biological metrics, and do not necessarily represent exactly where the species is located. Please refer to the species information found on ECOS to determine if suitable habitat for the species on your list occurs in your project area.

The purpose of the Act is to provide a means whereby threatened and endangered species and the habitats upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of Federal trust resources and to determine whether projects may affect federally listed species and/or designated critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.
If the Federal action agency determines that listed species or critical habitat *may be affected* by a federally funded, permitted or authorized activity, the agency must consult with us pursuant to 50 CFR 402. Note that a "may affect" determination includes effects that may not be adverse and that may be beneficial, insignificant, or discountable. An effect exists even if only one individual

or habitat segment may be affected. The effects analysis should include the entire action area, which often extends well outside the project boundary or "footprint." For example, projects that involve streams and river systems should consider downstream affects. If the Federal action agency determines that the action may jeopardize a *proposed* species or may adversely modify *proposed* critical habitat, the agency must enter into a section 7 conference. The agency may choose to confer with us on an action that may affect proposed species or critical habitat.

Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event they become proposed or listed prior to project completion. More information on the regulations (50 CFR 402) and procedures for section 7 consultation, including the role of permit or license applicants, can be found in our Endangered Species Consultation Handbook at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf.

We also advise you to consider species protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668 *et seq.*). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the Service. The Eagle Act prohibits anyone, without a permit, from taking (including disturbing) eagles, and their parts, nests, or eggs. Currently 1,026 species of birds are protected by the MBTA, including the western burrowing owl (*Athene cunicularia hypugaea*). Protected western burrowing owls can be found in urban areas and may use their nest/burrows year-round; destruction of the burrow may result in the unpermitted take of the owl or their eggs.

If a bald eagle or golden eagle nest occurs in or near the proposed project area, our office should be contacted for Technical Assistance. An evaluation must be performed to determine whether the project is likely to disturb or harm eagles. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles (see https://www.fws.gov/law/bald-and-golden-eagle-protection-act and https://www.fws.gov/program/eagle-management).

The Division of Migratory Birds (505/248-7882) administers and issues permits under the MBTA and Eagle Act, while our office can provide guidance and Technical Assistance. For more information regarding the MBTA, BGEPA, and permitting processes, please visit the following web site: https://www.fws.gov/program/migratory-bird-permit. Guidance for minimizing impacts to migratory birds for communication tower projects (e.g. cellular, digital television, radio, and emergency broadcast) can be found at https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation.

The U.S. Army Corps of Engineers (Corps) may regulate activities that involve streams (including some intermittent streams) and/or wetlands. We recommend that you contact the Corps to determine their interest in proposed projects in these areas. For activities within a National Wildlife Refuge, we recommend that you contact refuge staff for specific information about refuge resources, please visit this link or visit https://www.fws.gov/program/national-

wildlife-refuge-system to locate the refuge you would be working in or around.

If your action is on tribal land or has implications for off-reservation tribal interests, we encourage you to contact the tribe(s) and the Bureau of Indian Affairs (BIA) to discuss potential tribal concerns, and to invite any affected tribe and the BIA to participate in the section 7 consultation. In keeping with our tribal trust responsibility, we will notify tribes that may be affected by proposed actions when section 7 consultation is initiated. For more information, please contact our Tribal Coordinator, John Nystedt, at 928/556-2160 or John_Nystedt@fws.gov.

We also recommend you seek additional information and coordinate your project with the Arizona Game and Fish Department. Information on known species detections, special status species, and Arizona species of greatest conservation need, such as the western burrowing owl and the Sonoran desert tortoise (*Gopherus morafkai*) can be found by using their Online Environmental Review Tool, administered through the Heritage Data Management System and Project Evaluation Program (https://www.azgfd.com/wildlife-conservation/planning-for-wildlife/project-evaluation-program/).

We appreciate your concern for threatened and endangered species. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. If we may be of further assistance, please contact our Flagstaff office at 928/556-2118 for projects in northern Arizona, our general Phoenix number 602/242-0210 for central Arizona, or 520/670-6144 for projects in southern Arizona.

Sincerely,
/s/

Heather Whitlaw
Field Supervisor
Attachment

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

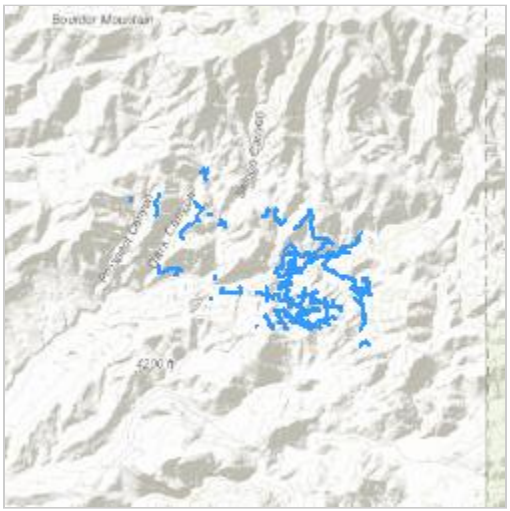
This species list is provided by:

Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
(602) 242-0210

PROJECT SUMMARY

Project Code: 2022-0090923
Project Name: Copper Creek
Project Type: Subsurface Exploration - Non Energy Materials
Project Description: Exploration
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.75825165,-110.49015187307592,14z



Counties: Pinal County, Arizona

ENDANGERED SPECIES ACT SPECIES

There is a total of 11 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Ocelot *Leopardus (=Felis) pardalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4474	Endangered

BIRDS

NAME	STATUS
Cactus Ferruginous Pygmy-owl *Glaucidium brasilianum cactorum* There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1225	Threatened
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

AMPHIBIANS

NAME	STATUS
Chiricahua Leopard Frog *Rana chiricahuensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1516	Threatened

FISHES

NAME	STATUS
Gila Chub *Gila intermedia* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/51	Endangered
Gila Topminnow (incl. Yaqui) *Poeciliopsis occidentalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1116	Endangered
Loach Minnow *Tiaroga cobitis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6922	Endangered
Spikedace *Meda fulgida* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6493	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Huachuca Water-umbel *Lilaeopsis schaffneriana var. recurva* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1201	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO BALD AND GOLDEN EAGLES WITHIN THE VICINITY OF YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO FWS MIGRATORY BIRDS OF CONCERN WITHIN THE VICINITY OF YOUR PROJECT AREA.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1C
- PSSC

RIVERINE

- R4SBC
- R2UBH
- R4SBJ

IPAC USER CONTACT INFORMATION

Agency: WestLand Resources, Inc.
Name: Scott Hart
Address: 4001 E. Paradise Fall Drive
City: Tucson
State: AZ
Zip: 85712
Email shart@westlandresources.com
Phone: 5202069585

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Bureau of Land Management