

**BIOLOGICAL EVALUATION
BASELINE HYDROLOGIC & GEOTECHNICAL
DATA GATHERING ACTIVITIES ON TONTO
NATIONAL FOREST**

RESOLUTION COPPER MINING

Prepared for:

USDA FOREST SERVICE
TONTO NATIONAL FOREST
Globe Ranger District
Pinal County, Arizona

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1. INTRODUCTION AND PURPOSE

Resolution Copper Mining, LLC (Resolution) contracted WestLand Resources Inc. (WestLand) to prepare a Biological Evaluation (BE) in support of proposed baseline hydrologic and geotechnical testing and monitoring activities (the Proposed Action). The Proposed Action would occur on National Forest System lands located within Tonto National Forest (TNF) and would inform Resolution's baseline environmental studies and data gathering to further the understanding of hydrology, geochemistry and geotechnical conditions over an area covering a range of potential alternative sites for tailings.

The purpose of this BE is to evaluate the potential effects of the Proposed Action on special-status species. Special-status species are defined for the purposes of this report as those species designated by the U.S. Fish and Wildlife Service (USFWS) as Endangered, Threatened, Proposed for listing, or Candidates, and those species designated by the U.S. Forest Service (USFS) as Sensitive. This BE was prepared in accordance with Forest Service Manual 2672, and includes the identification of all special-status species known or with potential to be present in the Proposed Action Area or its immediate vicinity. The Proposed Action Area is defined as the geographic or physical extent of activities to be completed as part of the Proposed Action.

2. PROJECT LOCATION

The Proposed Action Area consists of access roads, laydown yards, and discrete locations for test trenches, monitoring wells, and geotechnical drill sites located within TNF in Pinal County west and northwest of Superior, Arizona (*Figure 1*). The majority of the Proposed Action Area lies between Hewitt Canyon and Silver King Wash, bounded on the south by the MARRCO Railroad and US 60, and extending three to four miles north (*Figure 2*).

The Proposed Action would occur in non-contiguous areas of National Forest System lands in the following townships, ranges and sections of the Gila and Salt River Baseline and Meridian:

- Township 1 South, Range 11 East in portions of Sections 13, 21-28 and 33-36;
- Township 1 South, Range 12 East in portions of Sections 19-21, and 28-34;
- Township 2 South, Range 11 East in portions of Sections 1-3; and
- Township 2 South, Range 12 East in portions of Sections 5 and 6.

3. PROPOSED ACTION

The Proposed Action includes constructing hydrologic and geotechnical drill sites, test trenches, contractor laydown yards, conducting necessary roadway maintenance and improvements, and the use of temporary access roads. The total area of the Proposed Action, accounting for new construction activity, road improvements, use of the short term temporary access roads and existing road surfaces requiring no improvements is approximately 92.98 acres. Proposed new construction disturbance would occur on a total of 31.74 acres, all on National Forest System lands. The proposed activities are described in detail in the Baseline Hydrological and Geotechnical Gathering Activities Plan of Operations (Resolution 2013b).

4. PROPOSED ACTION AREA DESCRIPTION

4.1. PHYSICAL ENVIRONMENT

The Proposed Action Area occurs at the eastern edge of the Basin and Range Physiographic Province immediately adjacent to the Central Highlands Physiographic Province. The topography in the vicinity of the Proposed Action Area is characterized by south or southwest-trending ridges with intervening drainages that discharge to Queen Creek. In northern portions of the Proposed Action Area, the landscape transitions into steeper-sloped peaks and ridges with areas of bare rock and small cliffs. Exposed bedrock and outcrops occur along some canyons as well as in the northern portions of the Proposed Action Area. Elevations within the Proposed Action Area range from approximately 2,150 ft (685 m) above mean sea level (amsl) in the southwest portion to approximately 2,850 ft (1,000 m) amsl in the north central portion (*Figure 2*).

Geology within the Proposed Action Area is mixed with the majority of the central and southern portions of the Proposed Action Area comprised of Quaternary and Tertiary basin-fill deposits with Quaternary alluvial deposits along Queen Creek and major washes. Tertiary volcanic rocks, Paleozoic sedimentary rocks, younger Precambrian sedimentary rocks, basalt, and diabase, Tertiary Apache Leap tuff and Whitetail Conglomerate, and older Precambrian Pinal Schist comprise the majority of the northern and western portions of the Proposed Action Area (Richard 1998, Spencer et al. 1998; *Figure 3*). There are no known natural caves within the Proposed Action Area.

Soils within the majority of the Proposed Action Area are deep, gravelly, moderately fine and fine-textured, moderately sloping to steep soils on dissected old alluvial fan surfaces (ALRIS 1975). Soils within the northern and western portions of the Proposed Action Area are shallow, very gravelly and cobbly, moderately coarse to moderately fine-textured, gently sloping to very steep soils and rock outcrops on hills and mountains (ALRIS 1975).

4.2. LAND USE

Historic and current land uses within the TNF in the vicinity of the Proposed Action Area have primarily included small scale historic mining, low-density cattle grazing, and dispersed public recreation such as off-road vehicle use, target shooting, and hunting. General disturbance is most evident along existing roadways that currently appear to be used mainly for recreation, ranching activities, and power line maintenance, with numerous pullout areas found along roadways, generally in flat areas. Older disturbances associated with small-scale mining and ranching are also apparent. Small ranches and rural housing occur in the vicinity of the Proposed Action Area. Structures associated with historical mining activities include several mine adits and shafts that occur within the Proposed Action Area, several of which are located along Roblas Canyon (e.g., Bomboy Mine) and Happy Camp Canyon.

4.3. AQUATIC AND RIPARIAN RESOURCES

Relatively few aquatic features occur in the vicinity of the Proposed Action Area and perennial surface water appears to be minimal (Montgomery and Associates 2013, WestLand 2014a). Drainage features in the Proposed Action Area consist mainly of seven large drainage systems (Hewitt Canyon, Roblas Canyon, Bear Tank Canyon, Potts Canyon, Rice Water Canyon, Happy Camp Canyon, and Silver King Wash) and their tributaries. All seven of these systems are directly tributary to Queen Creek. Although some of the drainages do contain seasonally or perennial wetted areas (associated with the springs described below), these drainages are ephemeral, and no perennial or intermittent reaches of these drainages have been identified in the Proposed Action Area. Queen Creek has been designated as intermittent from Potts Canyon to the Whitlow Ranch Dam in Arizona's surface water quality standards (A.A.C. Title 18, Chapter 11, Appendix B).

Many of the desert washes and arroyos support xeroriparian vegetation in the form of relatively dense bands of mesquite (*Prosopis velutina*), catclaw acacia (*Senegalia greggii*) and desert hackberry (*Celtis pallida*) along channels or on terraces (see **Section 4.4** below for additional detail). The larger systems, in part, support some additional riparian vegetation in the form of individual, discontinuous patches, or narrow bands of Fremont cottonwood (*Populus fremontii*) and Goodding's willow (*Salix gooddingii*), often associated with the identified springs or with several stock ponds scattered throughout the Proposed Action Area and near vicinity (WestLand 2014a).

Six springs were identified within the Proposed Action Area, based on U.S. Geological Survey 7.5 minute topographic maps and field surveys (WestLand 2012a, Montgomery and Associates 2013, Resolution 2013a; **Figure 4**). These springs are identified as: Perlite Spring, Bear Tank Canyon Spring, Benson Spring, Potts Spring, Happy Camp Spring, and Lower Railroad Spring. Of these, two (Potts Spring and Lower Railroad Spring) were found to be dry and were considered to be no longer extant based on the lack of surface water or soil moisture and lack of spring-associated plants (WestLand 2012a). Perlite Spring was visited in February 2013 by Montgomery and Associates (2013) as part of hydrological investigations of portions of the Proposed Action Area. At the time of the site visit, three ponds were present on the surface of a perlite outcrop: the uppermost contained by an earthen berm, and the lower two within depressions formed as a result of historic quarrying of the perlite. Montgomery and Associates could find no evidence of groundwater inflow or seepage and concluded the ponds resulted from the collection and retention of surface water runoff (Montgomery and Associates 2013) and appear to not be sourced by any natural spring-fed seepage or inflow.

Extant springs in the Proposed Action Area and vicinity include Happy Camp, Bear Tank Canyon, and Benson springs (**Figure 4**). Happy Camp and Bear Tank Canyon springs were noted by Montgomery and Associates (2013) to have active discharge and some riparian vegetation. Both springs are at least partially modified for use in stock watering with active discharge measured at outlet pipes constructed into the springs. A stock pond is present in association with Happy Camp Spring. An area of the final extant spring, Benson Spring, has also been modified with a pump, discharge pipe, and stock tank for livestock watering. Observations of the Benson Spring (Montgomery and Associates 2013, WestLand 2012a, WestLand unpublished observations) were unable to identify baseflow in the area or a source of

seepage from the pools associated with the spring. Rain events during Montgomery and Associates (2013) visits to the spring were determined to have contributed a runoff component to the pools and the area was recommended for continued monitoring to determine more details of any potential baseflow. In general, all three of the extant springs support some riparian vegetation including individuals and small patches of Fremont cottonwood and Goodding's willow as well as small patches of seasonally occurring emergent species (e.g., cattails (*Typha* spp.) and sedges at Benson Spring (WestLand 2012a). Dense vegetation in the form of under- and mid-story vegetation is generally lacking and several individual trees at Bear Tank Canyon Spring appeared stressed at the time of the field investigations.

4.4. VEGETATION COMMUNITIES AND MAJOR PLANT ASSOCIATIONS

The Proposed Action Area occurs within the Arizona Upland subdivision of the Sonoran Desertscrub biotic community as mapped by Brown and Lowe (1980) and described by Turner and Brown (1982). Brown and Lowe's (1980) mapping classifications were made on a large scale and do not show finer scale variations of vegetation associations within a relatively small area such as the Proposed Action Area. WestLand (2013a, 2014b, In Prep.) provided a relatively fine-scale vegetation map identifying seven major plant associations that occur within the Proposed Action Area and immediate vicinity. These associations included 1) Jojoba-Paloverde Shrubland, 2) Ocotillo-Paloverde/Mixed Cacti Shrubland, 3) Jojoba-Paloverde/Triangleleaf Bursage Shrubland, 4) Single Whorl Burrobrush Shrubland, 5) Mesquite-Catclaw Acacia Wash Shrubland 6) Rock Outcrop, and 7) Crucifixion Thorn Shrubland (**Figure 4**). With the exception of Rock Outcrop and Crucifixion Thorn Shrubland, all of these associations occur within the Proposed Action Area (**Table 1**). The dominant, co-dominant, and associated plant species of each vegetation association are described below and in more detail in WestLand (2013a, 2014b, In Prep.).

Table 1. Major plant associations found in the Proposed Action Area¹ and the respective area that would be disturbed by the Proposed Action

Plant Association Type	Acres Disturbed (ha)
Jojoba-Paloverde Shrubland	25.69 (10.40)
Ocotillo-Paloverde/Mixed Cacti Shrubland	0.12 (0.05)
Jojoba-Paloverde/Triangleleaf Bursage Shrubland	0.61 (0.25)
Single Whorl Burrobrush Shrubland	0.05 (0.02)
Mesquite-Catclaw Acacia Wash Shrubland	5.27 (2.13)
Rock Outcrop	0.00 (0.00)
Crucifixion Thorn Shrubland	0.00 (0.00)
Total	31.74 (12.85)

¹ WestLand 2013a, 2014b, In Prep

4.4.1. Jojoba-Paloverde Shrubland

Jojoba-Paloverde Shrubland is the most common association present within the Proposed Action Area (**Figure 4**); most of this association is represented by foothill paloverde (*Parkinsonia microphylla*) with an understory of jojoba (*Simmondsia chinensis*) and/or other shrubs and cacti (**Appendix A, Photo 1**). In

many areas saguaros (*Carnegiea gigantea*) are common. Generally, west- to north-facing aspects have less foothill paloverde than east- and south-facing aspects, while dense stands of jojoba occupy west-facing aspects (**Appendix A, Photo 2**). Flat-top buckwheat (*Eriogonum fasciculatum*), turpentine bush (*Ericameria laricifolia*), brittlebush (*Encelia farinosa*), snakeweed (*Gutierrezia sarothrae*), and various cacti can occur in the understory with jojoba, and in some areas jojoba is uncommon. On alluvial terraces with relatively deep, calcareous soil, creosotebush (*Larrea tridentata*) may form a near-monoculture (**Appendix A, Photo 3**). Ocotillo (*Fouquieria splendens*) and mesquite are sometimes present in low numbers. Cactus species include teddybear cholla (*Opuntia bigelovii*), staghorn cholla (*O. acanthocarpa*), Engelmann pricklypear (*O. engelmannii*), and chainfruit cholla (*O. fulgida*). The perennial vines Arizona swallow-wort (*Cynanchum arizonicum*) and slender janusia (*Janusia gracilis*) occur in some higher elevation areas. There is an estimated 25.69 acres (10.40 ha) of this vegetation association proposed to be disturbed during new construction (**Table 1**).

4.4.2. Ocotillo-Paloverde/Mixed Cacti Shrubland

This association occurs within the Proposed Action Area on areas of shallow Tertiary volcanic bedrock, such as on the hilltops near Perlite Spring (**Figure 4**). Ocotillo and foothill paloverde are co-dominant with an understory of brittlebush, mariola (*Parthenium incanum*), and white ratany (*Krameria grayi*) (**Appendix A, Photo 4**). Barrel cactus species (*Ferocactus wislizenii* and *F. cylindraceus*) occur in these areas in greater abundance than in the surrounding areas. Arizona spikemoss (*Selaginella arizonica*) and the limestone-loving Cochise cloakfern (*Astrolepis cochisensis*) are often found on these outcrops (**Appendix A, Photo 5**), along with a diverse mix of limestone-affiliated plants, including ayenia (*Ayenia microphylla*), red grama (*Bouteloua trifida*), desert rosemallow (*Hibiscus coulteri*), Parry's false prairie-clover (*Marina parryi*), and milkwort (*Polygala* sp.). Sotol (*Dasyilirion wheeleri*), uncommon in the area, is restricted to north-facing aspects on these limestone outcrops (**Appendix A, Photo 6**). There is an estimated 0.12 acres (0.05 ha) of this vegetation association proposed to be disturbed during new construction.

4.4.3. Jojoba-Paloverde/Triangleleaf Bursage Shrubland

This association occurs in the Proposed Action Area, most notably around FR1918 (**Figure 4**). Soils derived from Precambrian rock support dense patches of triangleleaf bursage (*Ambrosia deltoidea*), although jojoba is often present in low numbers. These sites occasionally support dense concentrations of saguaros (**Appendix A, Photo 7**). Fairyduster (*Calliandra eriophylla*), creosotebush (*Larrea tridentata*) and desert lavender (*Hyptis emoryi*) can occur in this association as well. There are smaller inclusions of limestone in this association that support several perennial forbs on limestone derived substrate including desert zinnia (*Zinnia acerosa*), woody crinklemat (*Tiquilia canescens*), and desert trumpet (*Eriogonum inflatum*), as well as the graminoid fluffgrass (*Dasyochloa pulchella*) (**Appendix A, Photo 8**). There is an estimated 0.61 acres (0.25 ha) of this vegetation association proposed to be disturbed during new construction.

4.4.4. Single Whorl Burrobrush Thicket Shrubland

This association is limited within the Proposed Action Area to very broad washes (principally Queen Creek; **Figure 4**) with intermittent fluvial processes, such as rapid sheet and gully flow that scour the channel bottoms. The vegetation ranges from sparse and patchy to moderately dense, and typically occurs along the banks, but may occur within the channel. The vegetation is dominated by singlewhorl burrobrush (*Ambrosia monogyra*) (**Appendix A, Photo 9**) while other shrubs present include desert broom (*Baccharis sarothroides*), desert willow (*Chilopsis linearis*), and an occasional Fremont cottonwood. Mesquite, catclaw acacia, desert hackberry, wolfberry (*Lycium* sp.), and saltcedar (*Tamarix* sp.) occur as dense thickets on the low terraces. There is an estimated 0.05 acres (0.02 ha) of this vegetation association proposed to be disturbed during new construction.

4.4.5. Mesquite-Catclaw Acacia Wash Shrubland

This association is widespread throughout the drainages in the Proposed Action Area (**Figure 4**). While other shrubs may be present, mesquite and catclaw acacia (**Appendix A, Photo 10**) are ubiquitous in areas of ephemeral water flow. Blue paloverde (*Parkinsonia florida*) can also frequently occur near drainages. Shrub species along channels or on terraces include desert hackberry, wolfberry, desert willow, arrowweed (*Pluchea sericea*), graythorn (*Ziziphus obtusifolia*) and a few, scattered individuals of buttonbush (*Cephalanthus occidentalis*). Commonly occurring cacti include chainfruit cholla, staghorn cholla, prickly pear, and barrel cactus. In the vicinity of the Proposed Action Area, Happy Camp Canyon, Roblas Canyon, Rice Water Canyon, Potts Canyon, and Whitfield Canyon support individuals, discontinuous patches, or narrow bands of medium to large Fremont cottonwoods and Goodding's willow. There is an estimated 5.27 acres (2.13 ha) of this vegetation association proposed to be disturbed during new construction.

4.4.6. Rock Outcrop

This association occurs in the vicinity of the Proposed Action Area on Paleozoic sedimentary rocks exposed in lower Whitford Canyon (**Figure 4**). An unusual mix of plants is present including hopbush (*Dodonaea viscosa*), several species of buckwheat (*Eriogonum fasciculatum*, *E. wrightii*), lemon verbena (*Aloysia wrightii*), turpentine bush (*Ericameria laricifolia*), and Coulter's brickellbush (*Brickellia coulteri*) (**Appendix A, Photo 11**). Arizona spikemoss (*Selaginella arizonica*) covers the exposed bedrock in places. There is no acreage of this vegetation association proposed to be disturbed during new construction.

4.4.7. Crucifixion Thorn Shrubland

This association has an isolated occurrence in the vicinity of the Proposed Action Area on a hill with loamy soil west of Bear Tank Canyon. In this association, the upper shrub layer is composed of crucifixion-thorn (*Canotia holacantha*), with a sparse herbaceous layer. These sclerophyllous plants, growing to heights of over 10 ft (3 m) in some cases, form a dense colony, appearing from a distance as a homogenous stand (**Appendix A, Photo 12**). Foothill paloverde, creosotebush, and jojoba are found in

lower numbers within the shrub layer, while understory shrubs include white ratany and snakeweed. There is no acreage of this vegetation association proposed to be disturbed during new construction.

5. CONSULTATION HISTORY

A Proposed Plan of Operations titled “Resolution Copper Mining, LLC Baseline Hydrologic & Geotechnical Data Gathering Activities on Tonto National Forest” was prepared by Resolution and a draft was submitted to USFS on June 20, 2013 (Resolution 2013b). The TNF has not yet initiated consultation on this effort.

6. SCREENING ANALYSIS FOR SPECIAL-STATUS SPECIES

6.1. APPROACH

The purpose of this screening analysis was to determine the potential for occurrence of special-status species within the Proposed Action Area. Special-status species include USFWS Endangered, Threatened, Proposed and Candidate species (collectively referred to as USFWS listed species), and USFS TNF Sensitive species. Special-status species lists for the Proposed Action Area and vicinity were based on those maintained by TNF (*Appendix B*) with updated information from the USFS and USFWS final and proposed rules recently published in the Federal Register (*Appendix C*). The screening analysis also determined if designated or proposed critical habitat for USFWS listed species was located within or in the vicinity of the Proposed Action Area.

The principal resources used to inform the screening analysis and make a determination for the potential of special-status species to occur included: 1) the USFWS final and proposed rules as published in the Federal Register; 2) the results of an Arizona Game and Fish Department (AGFD) Heritage Database Management System (HDMS) on-line environmental review tool query (*Appendix D*); 3) AGFD plant and animal species abstracts (AGFD 2014); 4) published and grey literature; 5) the results of various WestLand surveys and field observations on the physical environments and biological resources of the Proposed Action Area (*Section 4*); and, 6) the USFWS Critical Habitat Portal online mapping tool (USFWS 2014).

The determination of the potential for a special-status species to occur in the Proposed Action Area was based on the following analytical process: 1) a review of the known geographical and elevational range of the species, 2) a review of occurrence records for the species from the resources listed in the preceding paragraph, 3) a review of the known habitat requirements and natural history of the species, and 4) a review of previous surveys, field observations and habitat descriptions of the Proposed Action Area.

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

Present – The species has been observed in the Proposed Action Area during site visits or has been documented in the Proposed Action Area based on records from recent, reliable sources (e.g., AGFD, USFWS, museum records), and habitats required by the species are known to be currently present.

Possible – The species has not been documented in the Proposed Action Area, but the known, current geographic and elevational range of the species includes the Proposed Action Area and habitat required by the species appears to be present in the Proposed Action Area.

Unlikely – Generally, the known, current geographic range of the species does not include the Proposed Action Area, but the range of the species is close enough such that the Proposed Action Area may be within the dispersal distance of the species. The required habitat characteristics of the species may be present in the Proposed Action Area, however, the potential for occurrence of these species is insignificant and detailed discussion in this screening analysis was not deemed warranted.

None – The Proposed Action Area is outside the known geographic and/or elevational range of the species and the habitat required by the species is not present.

6.2. SCREENING ANALYSIS RESULTS

Screening analysis results for the special-status species are provided below in **Table 2**. USFWS listed species with potential to occur included Sonoran Desert tortoise (*Gopherus morafkai*), a candidate species, that is known to be *present* in the Proposed Action Area. The southwestern willow flycatcher (*Empidonax traillii extimus*), an endangered species, the yellow-billed cuckoo (*Coccyzus americanus occidentalis*), a proposed threatened species, and the lesser long-nosed bat (*Leptonycteris yerbabuenae*), an endangered species, were considered to have an *unlikely* potential for occurrence in the Proposed Action Area.

Of the USFS sensitive species, Abert's towhee (*Melospiza aberti*) is known to be *present* in the Proposed Action Area (WestLand 2013a, 2013b). Other USFS sensitive species that have *possible* potential to occur include: three plant species - Hohokam agave (*Agave murpheyi*), mapleleaf false snapdragon (*Mabrya acerifolia*), and Pima Indian mallow (*Abutilon parishii*); one reptile species - Bezy's night lizard (*Xantusia bezyi*); and one bat species - pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*).

USFS sensitive species with an *unlikely* potential to occur include: one plant species - Cochise sedge (*Carex ultra*); one amphibian species - lowland leopard frog (*Lithobates yavapaiensis*); two bird species - American peregrine falcon (*Falco peregrinus anatum*) and sulphur-bellied flycatcher (*Myiodynastes luteiventris*); and two bat species - Allen's big-eared bat (*Idionycteris phylotis*) and western red bat (*Lasiurus blossevillii*).

Table 2. Screening Analysis for USFWS Threatened, Endangered, Proposed and Candidate Species and Forest Sensitive Species

Species and Status	Potential for Occurrence and Effect Determination
USFWS Federal Threatened, Endangered and Proposed or Candidate Species	
PLANTS	
<p>Arizona cliffrose (<i>Purshia Subintegra</i>) Endangered; no designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. This plant occurs in sparsely vegetated areas near ephemeral drainages in rocky, limestone hills and slopes within Sonoran desertscrub. The Proposed Action Area lacks this habitat type and is outside of this species' known range. (AGFD 2014).</p> <p>Effect Determination: The Proposed Action would have no effect on the Arizona cliffrose or its habitat.</p>
<p>Arizona hedgehog cactus (<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>) Endangered; no designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. This cactus is found in higher elevation areas of Interior Chaparral or Madrean Evergreen Woodland. The Proposed Action Area lacks this habitat type and is outside of this species' known range (AGFD 2014). This cactus is known to be present at Oak Flat, east of Superior. WestLand (2013a) did not detect this species during targeted surveys.</p> <p>Effect Determination: The Proposed Action would have no effect on the Arizona hedgehog cactus or its habitat.</p>
FISH	
<p>Colorado pikeminnow (<i>Ptychocheilus lucius</i>) Endangered; designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the Colorado pikeminnow or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>
<p>Desert pupfish (<i>Cyprinodon macularius</i>) Endangered; designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments. No natural populations of this fish remain in Arizona, but it has been introduced at Ayer Lake at the Boyce-Thompson Arboretum (TNF 2000). HDMS has records of this species within 3 miles of the Proposed Action Area, presumably at Ayer Lake (Appendix D).</p> <p>Effect Determination: The Proposed Action would have no effect on desert pupfish or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>
<p>Gila chub (<i>Gila intermedia</i>) Endangered; designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments.</p> <p>Effect Determination: The Proposed Action would have no effect on Gila chub. There is no critical habitat in the vicinity of the Proposed Action Area.</p>
<p>Gila topminnow (<i>Poeciliopsis occidentalis occidentalis</i>) Endangered; no designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments. HDMS has records of this species within 3 miles of the Proposed Action Area (Appendix D); these records likely represent an introduced population at Ayer Lake at the Boyce-Thompson Arboretum (AGFD 2014).</p> <p>Effect Determination: The Proposed Action would have no effect on the Gila topminnow or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
Gila trout <i>(Oncorhynchus gilae gilae)</i> Threatened; no designated critical habitat	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the Gila trout or its habitat.</p>
Headwater chub <i>(Gila nigra)</i> Candidate and Forest Sensitive	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the headwater chub or its habitat.</p>
Loach minnow <i>(Tiaroga cobitis)</i> Endangered; designated critical habitat	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the loach minnow or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>
Roundtail chub <i>(Gila robusta)</i> Candidate and Forest Sensitive	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the roundtail chub or its habitat.</p>
Razorback sucker <i>(Xyrauchen texanus)</i> Endangered; designated critical habitat	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the razorback sucker or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>
Spikedace <i>(Meda fulgida)</i> Endangered; designated critical habitat	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the spikedace and its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>
Woundfin <i>(Plagopterus argentissimus)</i> Endangered; designated critical habitat	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area does not include any suitable aquatic environments and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the woundfin or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>
AMPHIBIANS	
Chiricahua leopard frog <i>(Lithobates [Rana] chiricahuensis)</i> Threatened; designated critical habitat	<p>Potential to Occur in Proposed Action Area: None. Species is restricted to perennial to near-perennial aquatic environments. Proposed Action Area is outside of known geographic range and does not include any perennial creeks or streams and the few, small isolated seeps and springs likely do not provide suitable habitat.</p> <p>Effect Determination: The Proposed Action would have no effect on Chiricahua leopard frog or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>

Species and Status	Potential for Occurrence and Effect Determination
REPTILES	
<p>Narrow-headed gartersnake (<i>Thamnophis rufipunctatus</i>) Proposed Threatened and Forest Sensitive; proposed critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Species is restricted to perennial aquatic habitat in montane regions. Proposed Action Area is outside of known geographic range and does not include any suitable aquatic environments.</p> <p>Effect Determination: The Proposed Action would have no effect on the narrow-headed gartersnake or its habitat. There is no proposed critical habitat in vicinity of Proposed Action Area.</p>
<p>Northern Mexican gartersnake (<i>Thamnophis eques megalops</i>) Proposed Threatened and Forest Sensitive; proposed critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Species is strongly associated with perennial aquatic environments (e.g., streams, cienegas, and occasionally stock tanks) that support dense riparian or wetland vegetation. Proposed Action Area is outside of currently recognized geographic range (Brennan and Holycross 2006) and does not support the dense aquatic, riparian or wetland environments necessary to support this species.</p> <p>Effect Determination: The Proposed Action would have no effect on the Northern Mexican gartersnake or its habitat. There is no proposed critical habitat in vicinity of Proposed Action Area.</p>
<p>Sonoran desert tortoise (<i>Gopherus morafkai</i>) Candidate and Forest Sensitive</p>	<p>Potential to Occur in Proposed Action Area: Present. Species primarily occurs in desert rocky foothills and lower bajadas of the Sonoran desert (AGFD 2014). Proposed Action Area falls within geographic range and habitat. HDMS has records for this species within 3 miles of the Proposed Action Area (Appendix D) and WestLand (2013a and 2014c.) has observed desert tortoise in the Proposed Action Area and vicinity.</p> <p>Effect Determination: The Proposed Action is unlikely to have significant direct or indirect adverse effects on Sonoran desert tortoise or its habitat. A Biological Resources Monitoring Plan has been developed to minimize any impacts to individual tortoises (WestLand 2014d) and disturbance to rocky outcrops and washes would be minimized. This species is considered further below.</p>
BIRDS	
<p>Mexican spotted owl (<i>Strix occidentalis lucida</i>) Threatened; designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs in canyons and dense, generally older forests of mixed conifer or ponderosa pine/Gambel oak at elevations of 4,100 to 9,000 ft. Proposed Action Area is below lower elevation limit, and does not support suitable mixed conifer or pine/oak forest habitat.</p> <p>Effect Determination: The Proposed Action would have no effect on the Mexican spotted owl or its habitat. There is no critical habitat in vicinity of Proposed Action Area.</p>

Species and Status	Potential for Occurrence and Effect Determination
<p>Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>) Endangered; designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species is dependent on cottonwood/willow and/or tamarisk riparian communities along rivers and streams; prefer riparian areas with dense under- and mid-story vegetation that is ≥ 10 ft. in height, with or without canopy cover, and in close proximity to surface water.</p> <p>HDMS has records for this species within 3 miles of the Proposed Action Area (<i>Appendix D</i>). The vicinity of the Proposed Action Area includes limited riparian or aquatic environments. Several canyons in the vicinity of the Proposed Action Area do support riparian vegetation in the form of individual, discontinuous patches, or narrow bands of Fremont cottonwood and Goodding's willow. These areas lack dense under- and mid-story vegetation and only occasionally occur over seasonal surface water and as such represent at best marginal habitat for this species; this species would not be anticipated to breed in vicinity of Proposed Action Area. Additionally, species was not detected in the vicinity of Proposed Action Area during WestLand (2013b) avian surveys in May and June 2013.</p> <p>Effect Determination: The Proposed Action would have no effect on Southwestern willow flycatcher or their habitat because the species is unlikely to occur and the Proposed Action would not disturb extant riparian trees in canyon bottoms. There is no critical habitat in vicinity of Proposed Action Area.</p>
<p>Yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>) Proposed Threatened</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species is typically associated with dense riparian forest and woodland environments including cottonwood-willow galleries and mesquite bosques (<i>Appendix D</i>). In southeastern Arizona, they are known to nest along intermittent streams supporting dense stands of mesquite and netleaf hackberry.</p> <p>HDMS has records for this species within 3 miles of the Proposed Action Area (<i>Appendix D</i>). The vicinity of the Proposed Action Area includes limited riparian environments. Several canyons in the vicinity of the Proposed Action Area do support riparian vegetation in the form of individual, discontinuous patches, or narrow bands of Fremont cottonwood and Goodding's willow but these areas do not support dense riparian forest suitable for this species. Several of the desert washes and arroyos support xeroriparian vegetation in the form of narrow bands and patches of mesquite, catclaw acacia and desert hackberry along channels or on adjacent terraces. While these latter vegetation communities do occur along several of the major drainages in the Proposed Action Area, they are scattered and do not form contiguous, dense stands and thus are unlikely to represent suitable cuckoo habitat. Given the proximity to known records, these areas might occasionally serve as foraging habitat but would not represent areas suitable for breeding. Additionally, species was not detected in the vicinity of Proposed Action Area during WestLand (2013b) avian surveys in May and June 2013.</p> <p>Effect Determination: The Proposed Action is unlikely to affect yellow-billed cuckoos or their habitat because the species is unlikely to occur and the Proposed Action would not disturb extant riparian trees in canyon bottoms and would minimize disturbance to xeroriparian vegetation along arroyos and washes.</p>
<p>Yuma clapper rail (<i>Rallus longirostris yumanensis</i>) Endangered; no designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs in marshy areas with dense emergent vegetation. Vicinity of Proposed Action Area does not include suitable aquatic or marsh environments.</p> <p>Effect Determination: The Proposed Action would have no effect on the Yuma clapper rail or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
M A M M A L S	
<p>Lesser long-nosed bat (<i>Leptonycteris yerbabuena</i>) Endangered; no designated critical habitat</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species roosts in caves and abandoned mines and primarily occurs in desertscrub and semi-desert grasslands supporting columnar cacti and paniculate agave species. Proposed Action Area occurs at the edge of the currently recognized northeastern extent of this species' geographic range (Hoffmeister 1986, Cockrum 1991). Further, this northeastern range boundary appears to be, at least in part, based on extralimital records of immature individuals observed ~40 miles to the northwest and southwest of the Proposed Action Area (AGFD 2014; USFWS 1994). Closest known maternity colony is about 70 miles to the southwest.</p> <p>This species was not detected at Boyce Thompson Arboretum during mist netting efforts in 2001 and 2002 (Tim Snow, AGFD, pers. comm.) or during WestLand (2012b) bat surveys in vicinity of Proposed Action Area. Saguaros are the only species of columnar cactus present on site. The only species of agave detected during vegetation mapping in the vicinity of Proposed Action Area was <i>Agave chrysantha</i> (WestLand 2014b, <i>In Prep.</i>); this species is not cited as a food source for lesser long-nosed bats (USFWS 1994) and does not require bats for pollination. According to Turner et. al. (1995), <i>A. palmeri</i>, a known agave food source for lesser long-nosed bats, is not recorded in the Proposed Action Area or vicinity. Hohokam agave (<i>Agave murpheyi</i>, described below) is known from the area and may provide, or have provided, a food source for this bat species (USFWS 1994).</p> <p>Effect Determination: The Proposed Action would have no effect on lesser long-nosed bat or its habitat because the species is unlikely to be present and proposed activities would not affect potential roosts (i.e., mines), and disturbance to saguaro cactus and agave would be minimal.</p>
TNF Sensitive Species	
P L A N T S	
<p>Aravaipa sage aka. Galiuro sage (<i>Salvia amissa</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs in shady canyon bottoms, near streams of the Galiuro and Superstition Mountains (AGFD 2014). Vicinity of Proposed Action Area is outside of known geographic range and contains no streams and only scattered patches of riparian vegetation.</p> <p>Effect Determination: The Proposed Action would have no effect on Aravaipa sage or its habitat.</p>
<p>Aravaipa woodfern (<i>Thelypteris puberula</i> var. <i>sonorensis</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs in association with mesic canyons (AGFD 2014). Vicinity of Proposed Action Area contains no mesic canyons and only scattered patches of riparian vegetation and few seeps and springs.</p> <p>Effect Determination: The Proposed Action would have no effect on Aravaipa woodfern or its habitat.</p>
<p>Arizona alum root (<i>Heuchera glomerulata</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species is associated with north-facing shaded rocky slopes near seeps, springs, and riparian areas (AGFD 2014). Vicinity of Proposed Action Area contains only scattered patches of riparian vegetation and few seeps and springs, and the species is not known from Pinal County.</p> <p>Effect Determination: The Proposed Action would have no effect on Arizona alum root or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
<p>Arizona bugbane (<i>Cimicifuga arizonica</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs in moist loamy soil in riparian deciduous forest at elevations of 4,800 to 6,900 ft (ARPC 2001). Vicinity of Proposed Action Area does not contain riparian deciduous forest and is below the known elevation range.</p> <p>Effect Determination: The Proposed Action would have no effect on Arizona bugbane or its habitat.</p>
<p>Arizona phlox (<i>Phlox amabilis</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs in exposed limestone and rocky slopes near Ponderosa pine and pinyon-juniper woodlands at elevations of 3,500 to 7,800 ft (AGFD 2014). Proposed Action Area does not include forested habitat and is outside of the known geographic range for this species.</p> <p>Effect Determination: The Proposed Action would have no effect on the Arizona phlox or its habitat.</p>
<p>Blumer’s dock (<i>Rumex orthoneurus</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species is endemic to high-elevation riparian and cienega habitats between elevations of 6,500 and 11,500 ft (AGFD 2014). Vicinity of Proposed Action Area is well below the known elevation range and does not contain high elevation riparian and cienega environments.</p> <p>Effect Determination: The Proposed Action would have no effect on the Blumer’s dock or its habitat.</p>
<p>Chihuahuan sedge (<i>Carex chihuahuensis</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species typically occurs in north- and northwest-facing slopes in wet soils in streambeds, wet meadows, cienegas, at elevations of 3,600 and 7,200 ft (AGFD 2014). Vicinity of Proposed Action Area does not contain suitable aquatic resources, and is outside of the known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the Chihuahuan sedge or its habitat.</p>
<p>Cochise sedge (<i>Carex ultra</i>, also <i>Carex spissa</i> var. <i>ultra</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species associated with saturated soils near or in perennial seeps, streams, and springs from elevations of 2,500 to 6,000 ft (AGFD 2014). There are no records of this species from the Proposed Action Area or its vicinity; nearest records are ~65 miles to the northwest and ~40 miles to the southeast (AGFD 2014, SEINet 2014). Vicinity of Proposed Action Area contains only scattered patches of riparian vegetation and a few small seeps and springs that may contain saturated soils. Given the paucity of nearby records and potential seep and spring habitats, we consider the possibility for occurrence to be low.</p> <p>Effect Determination: The Proposed Action would have no effect on the Cochise sedge or its habitat because Proposed Action will not disturb any of the extant spring environments.</p>
<p>Eastwood alum root (<i>Heuchera eastwoodiae</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs along moist slopes in ponderosa pine forests and canyons at elevations between 3,500 and 8,000 ft (TNF 2000; AGFD 2014). Proposed Action Area lacks habitat with moist slopes in ponderosa pine forests and canyons.</p> <p>Effect Determination: The Proposed Action would have no effect on the Eastwood alum root or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
Fish Creek fleabane <i>(Erigeron piscaticus)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species is associated with perennial streams and is found on upper floodplain terraces in moist, shady canyon bottoms between elevations of 2,250 and 3,500 ft (TNF 2000). Vicinity of Proposed Action Area does not include any perennial streams and contains only scattered patches of riparian environments, and there have been no records of this species from Pinal County (AGFD 2014).</p> <p>Effect Determination: The Proposed Action would have no effect on the Fish Creek fleabane or its habitat.</p>
Fish Creek rock daisy <i>(Perityle saxicola)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species occur in cracks and crevices on cliff faces, large boulders, and rocky outcrops in canyons and on buttes in xeric east and northeast exposures in Sonoran desertscrub at elevations between 2,000 and 3,500 ft (TNF 2000). Proposed Action Area is outside the limited known geographic range (AGFD 2014, SEINet 2014).</p> <p>Effect Determination: The Proposed Action would have no effect on the Fish Creek rock daisy or its habitat.</p>
Gila rock daisy aka. Salt River rock daisy <i>(Perityle gilensis var. salensis)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species associated with seeps on cliff faces, ledges, and rock outcrops at elevations between 3,000 and 4,000 ft. Variety <i>salensis</i> of this species is only known from a few localities in the Salt River Canyon. Variety <i>gilensis</i> of this species is known from Queen Creek Canyon (pers. comm. Mark Taylor (TNF), TNF 2000, SEINet 2014). Proposed Action Area does not include seeps on steep cliffs and rocky outcrops and is outside of known highly restricted range of this variety.</p> <p>Effect Determination: The Proposed Action would have no effect on the Gila rock daisy or its habitat.</p>
Hohokam agave <i>(Agave murpheyi)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Possible. Species occurs on alluvial terraces or hilly slopes above major drainages in desertscrub habitat. Associated with pre-Columbian agricultural and settlement features. Known from Queen Creek “near” Superior and Boyce Thompson Arboretum (ARPC 2001, AGFD 2014) which is in vicinity of the Proposed Action Area.</p> <p>Effect Determination: The Proposed Action is very unlikely to have an effect on Hohokam agave because their known distribution is in the immediate vicinity of Boyce-Thompson Arboretum and very little new disturbance would occur on the alluvial terrace along Queen Creek (see <i>Figure 2</i>).</p>
Horseshoe deervetch <i>(Acmispon [Lotus] mearnsii var. equisolensis)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species associated with limestone substrates at an elevation of 2,100 ft. Known only from vicinity of Horseshoe Reservoir on Verde River. Proposed Action Area outside known restricted geographic and elevation range for this species (ARPC 2001).</p> <p>Effect Determination: The Proposed Action would have no effect on the Horseshoe deervetch or its habitat.</p>
Hualapai milkwort <i>(Polygala rusbyi)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species generally found on limey or gypsiferous substrates in central Arizona at elevations of 2,000 to 4,700 ft (SEINet 2014). No specimens have been documented from Pinal County (AGFD 2014). Proposed Action Area is outside the known geographic range for this species.</p> <p>Effect Determination: The Proposed Action would have no effect on the Hualapai milkwort or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
Mapleleaf false snapdragon <i>(Mabrya acerifolia)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Possible. Species occurs in rhyolite rock crevices and overhangs on shaded cliffs and rock ledges, generally with north-to east-facing walls at an elevation of 1,800 to 3,350 ft (AGFD 2014). HDMS has records for this species within 3 miles of the Proposed Action Area (<i>Appendix D</i>). Proposed Action Area is within known geographic and elevation range for this species and cliff habitat is present in the vicinity of Proposed Action Area.</p> <p>Effect Determination: The Proposed Action would have no effect on mapleleaf false snapdragon because the Proposed Action would not occur on cliffs or rock ledges.</p>
Mogollon fleabane <i>(Erigeron anchana)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species occurs in rock crevices or ledges on boulders and vertical rock faces, usually in canyons in association with chaparral up to pine forest at an elevation of 3,500 to 7,000 ft (TNF 2000). Proposed Action Area is outside the known geographic range of this species (ARPC 2001) and does not support chaparral or pine forests.</p> <p>Effect Determination: The Proposed Action would have no effect on the Mogollon fleabane or its habitat.</p>
Mt. Dellenbaugh sandwort <i>(Arenaria aberrans)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species found primarily in oak-pine forests, but can also be found in open pine forests and among junipers at an elevation of 5,500 to 9,000 ft (AGFD 2014). Proposed Action Area is outside known geographic and elevation range.</p> <p>Effect Determination: The Proposed Action would have no effect on the Mt. Dellenbaugh sandwort or its habitat.</p>
Pima Indian mallow <i>(Abutilon parishii)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Possible. Species is associated with rocky hillsides and canyon bottoms among rocks and boulders in Sonoran desertscrub at an elevation of 1,720 to 4,900 ft (AGFD 2014). HDMS has records for this species within 3 miles of the Proposed Action Area (<i>Appendix D</i>). Proposed Action Area is within geographic range of this species (ARPC 2001), and includes potential habitat (WestLand 2013a, 2014b, In Prep).</p> <p>Effect Determination: The Proposed Action is unlikely to have an effect on the Pima Indian mallow or its habitat as the Proposed Action would generally not occur on rocky hillsides or in canyon bottoms. Disturbance footprint on hillsides would largely be restricted to temporary access roads used to bring a tracked rig to off-road locations; these activities would impact ~3.03 acres of undisturbed Sonoran desertscrub.</p>
Ripley wild buckwheat <i>(Eriogonum ripleyi)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Proposed Action Area is approximately 60 miles southeast of nearest known geographic locality at Horseshoe Reservoir (AGFD 2014).</p> <p>Effect Determination: The Proposed Action would have no effect on Ripley wild buckwheat or its habitat.</p>
Tonto Basin agave <i>(Agave delamateri)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Only known from Pinal Creek approximately 20 miles to the northeast (ARPC 2001). Occurs in Arizona upland desertscrub in association with hilly slopes near larger rivers and is associated with pre-Columbian agricultural and settlement features. Proposed Action Area is outside known range.</p> <p>Effect Determination: The Proposed Action would have no effect on Tonto Basin agave or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
Toumey's groundsel <i>(Packera [Senecio] neomexicana var. toumeyi)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Variety <i>toumeyi</i> is associated with loose rocky soil in oak chaparral or coniferous forests at elevations of 5,500 to 9,200 ft (AGFD 2014). Proposed Action Area is outside known distribution and below known elevation range for the species.</p> <p>Effect Determination: The Proposed Action would have no effect on Toumey's groundsel or its habitat.</p>
Verde breadroot <i>(Pediomelum verdiensis)</i>	<p>Potential to Occur in Proposed Action Area: None. Known from several localities in the upper and middle Verde River Basin including near the towns of Camp Verde and Perkinsville, Yavapai, Co., Arizona. Occurs at ~3,450 ft and is associated with Tertiary Verde limestone-derived soils and found in mixed Sonoran desert scrub and open juniper woodland as well as compacted soils along roadways (Welsh and Licher 2010). Proposed Action Area is outside known range.</p> <p>Effect Determination: The Proposed Action would have no effect on Verde breadroot or its habitat.</p>
INVERTEBRATES	
A caddisfly <i>(Wormaldia planae)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. In Arizona, known only from a few localities (e.g. along Fossil and Beaver creeks, Gila and Yavapai counties). Found in erosional stream environments at ~3,500 ft. Vicinity of Proposed Action Area supports a few, small aquatic features but is outside of the known restricted geographic range (Morse and Holzenthal 2008, Munoz-Quesada and Holzenthal 2008).</p> <p>Effect Determination: The Proposed Action would have no effect on <i>Wormaldia planae</i> or its habitat.</p>
A mayfly <i>(Fallceon eatoni)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species only known from a single locality in the Salt River Canyon in Gila Co., Arizona and northern Sonora, Mexico. Mayflies have an aquatic larval stage. Vicinity of Proposed Action Area supports a few, small aquatic features but is outside of the known restricted geographic range (McCafferty 2006).</p> <p>Effect Determination: The Proposed Action would have no effect on <i>Fallceon eatoni</i> or its habitat.</p>
Fossil springsnail <i>(Pyrgulopsis simplex)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Little of this species natural history is known, but members of the genus are typically associated with rocks or aquatic macrophytes in moderate stream currents (TNF 2000). Vicinity of Proposed Action Area includes only a few small isolated springs, no streams, and is outside of the known restricted geographic range (TNF 2000).</p> <p>Effect Determination: The Proposed Action would have no effect on the Fossil springsnail or its habitat.</p>
Net-winged midge <i>(Agathon arizonica)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species requires swift-moving streams, typically with waterfalls, that support its larvae. Adults do not leave the riparian corridors (TNF 2000). Vicinity of Proposed Action Area does not include any swift moving streams and is outside of currently known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on the net-winged midge or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
Parker's cyloepus riffle beetle <i>(Cylloepus parkeri)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species associated with stream riffles and is only known from two creeks in Bloody Basin (AGFD 2014; TNF 2000). Vicinity of Proposed Action Area does not include any streams and is outside of known geographic range.</p> <p>Effect Determination: The Proposed Action would have no effect on Parker's cyloepus riffle beetle or its habitat.</p>
FISH	
Desert sucker <i>(Catostomus clarki)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Vicinity of Proposed Action Area does not include any perennial creeks or streams.</p> <p>Effect Determination: The Proposed Action would have no effect on the desert sucker or its habitat.</p>
Sonora sucker <i>(Catostomus insignis)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Vicinity of Proposed Action Area does not include any perennial creeks or streams.</p> <p>Effect Determination: The Proposed Action would have no effect on the Sonora sucker or its habitat.</p>
AMPHIBIANS	
Lowland leopard frog <i>(Lithobates [Rana] yavapaiensis)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Unlikely. Species occurs in a variety of perennial to near perennial waters (AGFD 2014). HDMS has records for this species within 3 miles of the Proposed Action Area (Appendix D). Proposed Action Area does not include any perennial creeks or streams and the few, small isolated seeps and springs in the vicinity likely do not provide suitable habitat.</p> <p>Effect Determination: The Proposed Action would have no effect on the lowland leopard frog or its habitat because species is unlikely to occur and proposed activities would avoid any impacts to the few seep and spring environments that are present in the vicinity.</p>
Northern leopard frog <i>(Lithobates [Rana] pipiens)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species requires perennial to near-perennial water (AGFD 2014). Proposed Action Area is far outside known geographic range and does not include any suitable aquatic environments.</p> <p>Effect Determination: The Proposed Action would have no effect on the northern leopard frog or its habitat.</p>
Western barking frog <i>(Eleutherodactylus augusti cactorum)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. Species strongly associated with limestone, rhyolite, or granite outcrops within Madrean evergreen woodlands of southeastern Arizona. A mid-20th century observation from Sierra Anchas remains unconfirmed (Brennan and Holycross 2006). Proposed Action Area is well outside species' known range.</p> <p>Effect Determination: The Proposed Action would have no effect on the western barking frog or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
REPTILES	
Bezy's night lizard <i>(Xantusia bezyi)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Possible. Species is primarily associated with crevices found in rock outcrops, cliff faces, and boulder fields in Arizona upland desertscrub, semi-desert grassland, interior chaparral, and oak woodland communities. They have also been occasionally found in decaying sotol (<i>Dasyllirion wheeleri</i>) and <i>Yucca</i> spp., under plant material on the desert floor, and in buildings. Proposed Action Area occurs within the known range of this species (Bezy 2005, Brennan and Holycross 2006, Leavitt et al., 2007).</p> <p>Effect Determination: The Proposed Action is unlikely to have an effect on Bezy's night lizard. Activities would not impact rock outcrops, cliff faces, and boulder fields, and sotol and yuccas are limited in distribution and abundance in the area (WestLand 2013a, 2014b, In Prep.).</p>
BIRDS	
American peregrine falcon <i>(Falco peregrinus anatum)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Unlikely. Species is strongly associated with steep, rocky areas with cliffs near water. Vicinity of Proposed Action Area contains limited amounts of this habitat but is within the known geographic range; peregrines may forage in the Area. HDMS has records for this species within 3 miles of the Proposed Action Area (<i>Appendix D</i>) and peregrines have been observed consistently from 2003-2011, including observed breeding activities, from Apache Leap, ~4 miles to the east of the Area (WestLand 2012c). Species was not detected in the vicinity of Proposed Action Area during WestLand (2013b) avian surveys in May and June 2013.</p> <p>Effect Determination: The Proposed Action would have no effect on American peregrine falcon because proposed activities would not affect roosting or nesting habitat in steep cliff areas.</p>
Abert's towhee <i>(Melospiza [Pipilo] aberti)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: Present. A riparian species that occurs along densely vegetated desert rivers, streams, arroyos, and canals in Sonoran desertscrub. Nesting occurs in dense vegetation and has been observed in a wide variety of vegetation types but primarily lowland riparian thickets with Fremont cottonwood, Goodding willow, seepwillow and mesquite (Corman and Wise-Gervais 2005). Considered common year-round residents at the Boyce Thompson Arboretum near Superior. Proposed Action Area is within known geographic and elevation range and contains Sonoran desertscrub with scattered riparian vegetation in the vicinity and has been observed within Proposed Action Area (WestLand 2013b).</p> <p>Effect Determination: The Proposed Action is unlikely to have a direct effect on individual Abert's towhee because proposed activities are not proposed in areas containing extant riparian (cottonwood-willow) trees in canyon bottoms. Potential impacts to Abert's towhee habitat could occur along washes in the Mesquite-Catclaw Acacia Wash Shrubland plant association; approximately 3.33 acres of disturbance would occur in this association (see <i>Table I</i>).</p>
Bald eagle <i>(Haliaeetus leucocephalus)</i> Sensitive	<p>Potential to Occur in Proposed Action Area: None. In Arizona, species is associated with larger river systems and near reservoirs with large tree and/or cliffs. (AGFD 2014). Vicinity of Proposed Action Area contains only scattered patches of riparian vegetation.</p> <p>Effect Determination: The Proposed Action would have no effect on the bald eagle or its habitat.</p>

Species and Status	Potential for Occurrence and Effect Determination
<p>Northern goshawk (<i>Accipiter gentilis</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species occurs primarily in ponderosa pine, mixed-species forest, spruce-fir woodlands, and some riparian areas between 4,750 and 9,120 ft elevation (AGFD 2014). Proposed Action Area has no forested habitat and is outside the known elevation range for this species.</p> <p>Effect Determination: The Proposed Action would have no effect on the northern goshawk or its habitat.</p>
<p>Sulphur-bellied flycatcher (<i>Myiodynastes luteiventris</i>)</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species breeds from central to, primarily, southeastern Arizona; there are no breeding records from the vicinity of Proposed Action Area. Species is primarily associated with tall riparian woodlands and forests although they are known to forage along adjacent dry drainages and in oak and pine uplands (Corman and Wise-Gervais 2005). Several canyons in the vicinity of the Proposed Action Area do support riparian vegetation in the form of individual, discontinuous patches, or narrow bands of Fremont cottonwood and Goodding’s willow (see Section 4.3). Many of the desert washes and arroyos support xeroriparian vegetation in the form of relatively dense bands and patches of mesquite, catclaw acacia, and desert hackberry along channels or on terraces. Species was not detected in the Proposed Action Area during WestLand (2013b) avian surveys.</p> <p>Effect Determination: The Proposed Action would have no effect on the Sulphur-bellied flycatcher or its habitat because it is unlikely to be present in the area and proposed activities would not disturb extant riparian trees in canyon bottoms. Disturbances to mesquite-catclaw acacia wash shrubland would be limited to ~3.33 acres.</p>
<p>Yellow-eyed junco (<i>Junco phaeonotus</i>)</p>	<p>Potential to Occur in Proposed Action Area: None. Species is associated with moist, conifer forests and canyons in southeastern Arizona and absent from more arid mountain ranges. There is a breeding record ~10 miles to the northeast of the Proposed Action Area but this occurs in mountainous terrain at higher elevation than is found on the Area (Corman and Wise-Gervais 2005). Proposed Action Area does not include any mountainous conifer forest.</p> <p>Effect Determination: The Proposed Action would have no effect on the yellow eyed-junco or its habitat.</p>
B A T S	
<p>Allen’s big-eared bat aka. Allen’s lappet-browed bat (<i>Idionycteris phyllotis</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species occurs in woodlands and riparian areas in proximity to cliffs, rocky outcrops, or lava flows, often above water (AGFD 2014). Vicinity of Proposed Action Area contains potential habitat and is within the known geographic range for this species and it could use available roost sites and forage in the Area. The AGFD has not captured Allen’s big-eared bat during mist netting efforts at the Boyce Thompson Arboretum (Tim Snow, AGFD, pers. comm.) and species was not detected during WestLand’s bat survey of the Proposed Action Area vicinity (WestLand 2012b).</p> <p>Effect Determination: The Proposed Action would have no effect on Allen’s big-eared bat because species is unlikely to occur and the disturbance footprint of Proposed Action is minor compared with the scale at which this species uses the landscape. Potential roost sites (e.g., rocky outcrops, cliffs) would not be disturbed by proposed activities.</p>

Species and Status	Potential for Occurrence and Effect Determination
<p>Pale Townsend’s big-eared bat (<i>Corynorhinus townsendii pallescens</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: Possible. Species occurs in a wide range of biotic communities from 1,200-5,600 ft elevation. Roosts in caves and abandoned mine workings (TNF 2000). Proposed Action Area is within the known geographic and elevation range for this species and contains roosting habitat to support this species. Species has been captured at Boyce Thompson in 2001 and 2002 by AGFD and in the vicinity at Apache Leap and Oak Flat (WestLand 2012b).</p> <p>Effect Determination: The Proposed Action would have no effect on the Pale Townsend’s big-eared bat because the disturbance footprint of the Proposed Action is minor compared with the scale at which this species uses the landscape and because proposed activities would not impact any roosting habitat (e.g., abandoned mines).</p>
<p>Spotted bat (<i>Euderma maculatum</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: None. Species associated with low to high elevation desertscrub where they apparently roost singly in cracks and crevices on rocky cliffs near surface water (TNF 2000, AGFD 2014). The closest reported specimen of this species was collected at Tempe, about 50 miles west of the Proposed Action Area (Hoffmeister 1986) and AGFD (2014) shows no records in vicinity of Proposed Action Area.</p> <p>Effect Determination: The Proposed Action would have no effect on spotted bat or its habitat.</p>
<p>Western red bat (<i>Lasiurus blossevillii</i>) Sensitive</p>	<p>Potential to Occur in Proposed Action Area: Unlikely. Species associated with wooded riparian and upland areas and roosts in foliage of trees and occasionally shrubs. Primarily found in south central and southeastern Arizona from 1,900-7,200 ft elevation. Species known historically from Queen Creek in proximity to Proposed Action Area (AGFD 2014). HDMS has records for this species within 3 miles of the Proposed Action Area (<i>Appendix D</i>). Species was not observed by AGFD at Boyce Thompson during 2001–2002 netting efforts or in Queen Creek (WestLand 2012b). Western red bats were detected in Devils Canyon (WestLand 2012b) which supports dense riparian vegetation. Several canyons in the vicinity of the Proposed Action Area do support riparian vegetation in the form of individual, discontinuous patches, or narrow bands of Fremont cottonwood and Goodding’s willow and as such represent at best marginal habitat for this species.</p> <p>Effect Determination: The Proposed Action would have no effect on western red bat or their habitat because species is unlikely to occur and the proposed activities would not disturb extant riparian trees in canyon bottoms.</p>

7. SPECIAL-STATUS SPECIES EVALUATED FURTHER

7.1. SONORAN DESERT TORTOISE (*GOPHERUS MORAFKAI*)

Sonoran desert tortoises occur throughout much of the central and southwestern portions of Arizona. Based on genetic evidence, this species has recently been recognized as distinct from the Mohave desert tortoise (*Gopherus agassizii*) (USFWS 2011). The northeastern extent of this species' range abuts the Salt River in Gila County, while the easternmost records are located along the lower and middle San Pedro River valley in Cochise and Pinal counties. Populations of Sonoran desert tortoises are known to exist on the TNF (TNF 2000), and AGFD HDMS records confirmed their presence within 3 miles (4.8 km) of the Proposed Action Area (*Appendix D*).

Sonoran desert tortoise habitat includes primarily rocky slopes and bajadas occurring in Sonoran and Mohave desertscrub, primarily in the Arizona Upland Subdivision. They are also found associated with caliche caves, rock shelters, and cavities in and along desert washes. They have also been occasionally observed in semi-desert grassland communities, juniper woodland, and interior chaparral (Averill-Murray and Klug 2000). Populations occur at elevations from approximately 510 to 5,300 ft (155 to 1615 m) (AGFD 2014).

During Sonoran Desert tortoise surveys WestLand (2014c) documented five live tortoises, one tortoise carcass, two tortoise scats, and various other tortoise sign (e.g., tracks, active and potential burrows). Additionally, WestLand incidentally documented a total of eight live tortoises, one carcass, and two suitable burrows during various non-target surveys.

The geotechnical and hydrologic survey would disturb approximately 31.74 acres (12.85 ha) of Sonoran desertscrub, all of which must be considered as potentially suitable habitat for the Sonoran desert tortoise. Disturbance associated with Proposed Action would not result in significant adverse impacts to Sonoran desert tortoise or their habitat. General monitoring procedures as outlined in the Biological Resources Monitoring Plan (WestLand 2014d) would be followed when individual tortoises were encountered during construction activities. Guidelines for handling desert tortoise published by AGFD (2007) (*Appendix E*) would be used if it were absolutely necessary to move individual tortoises.

8. PREPARERS AND SIGNATURES

Preparers/Reviewers

The following WestLand Resources, Inc., personnel contributed written sections and/or provided technical review of this report. WestLand was retained to prepare this document for review by the Tonto National Forest on behalf of Resolution Copper Mining, LLC.

Aaron Graham, M.S. Environmental Science. Project Manager

Eric Wallace, M.S. Wildlife and Fisheries Sciences. Project Biologist

Signatures

I prepared this analysis of impacts to special-status species in the Proposed Action Area.

Aaron Graham
Project Manager, WestLand Resources, Inc.

Date

I approved this analysis of impacts to special-status species in the Proposed Action Area.

Mark Taylor
Forest Minerals Biologist
Tonto National Forest

Date

9. REFERENCES

- Arizona Game and Fish Department (AGFD). 2014. Unpublished abstracts and maps compiled and edited by the Heritage Data Management System (HDMS), Arizona Game and Fish Department, Phoenix, Arizona. Available at: http://www.azgfd.com/w_c/edits/hdms_abstracts.shtml. Accessed multiple dates, June 2013 through March 2014.
- Arizona Land Resource Information System (ALRIS). 1975. General Soil Map. USDA Soil Conservation Service and University of Arizona Experimental Station.
- Arizona Rare Plant Committee (ARPC). 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office.
- Averill-Murray, R.C., and C.M. Klug. 2000. Monitoring and ecology of Sonoran desert tortoises in Arizona. Nongame and Endangered Wildlife Program Technical Report 161. Arizona Game and Fish Department, Phoenix, Arizona.
- Bezy, R.L. 2005. The night lizards (*Xantusia*) of Arizona. *Sonoran Herpetologist* 18: 14-19.
- Brennan, T.C., and A.T. Holycross. 2006. A Field Guide to Amphibians and Reptiles in Arizona. Arizona Game and Fish Department, Phoenix, Arizona.
- Brown, D. E., and C. Lowe. 1980. Biotic Communities – Southwestern United States and Northwestern Mexico. Map. General Technical Report RM-78, Rocky Mountain Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture. (Reprinted 1994 by University of Utah Press, Salt Lake City, UT).
- Cockrum, E. L. 1991. Seasonal distribution of northwestern populations of the long-nosed bats, *Leptonycteris sanborni* Family Phyllostomidae. *Anales del Instituto de Biología Universidad Nacional Autónoma de México, Series Zoológica* 62:181–202.
- Corman, T.E., and C. Wise-Gervais. 2005. Arizona Breeding Bird Atlas. University of New Mexico Press, Albuquerque, NM.
- Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press, Tucson, Arizona.
- Leavitt, D.H., R.L. Bezy, K.A. Crandall, et al. 2007. Multi-locus DNA sequence data reveal a history of deep cryptic vicariance and habitat-driven convergence in the desert night lizard *Xantusia vigilis* species complex (Squamata: Xantusiidae). *Molecular Ecology* 16: 4455-4481.
- McCafferty, W.P. 2006. Rediscovery of *Fallceon eatoni* (Kimmings) (Ephemeroptera: Baetidae). *Proceedings of the Entomological Society of Washington* 108: 248-248.
- Montgomery & Associates. 2013. Technical Memorandum, Phase I Hydrogeologic Field Investigations, Near West Tailings Site, Pinal County, Arizona. May 1, 2013.

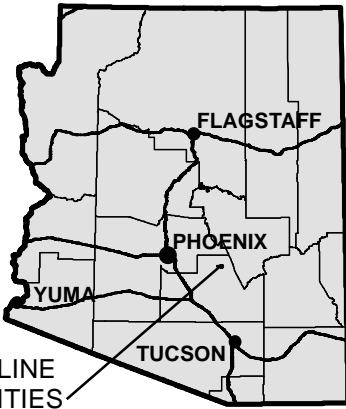
- Morse, J.C., and R.W. Holzenthal. 2008. Trichoptera genera. *In* Merritt, R.W., K.W. Cummins, and M.B. Berg (editors). An introduction to the aquatic insects of North America. Fourth edition. Kendall/Hunt Publishing Company, Dubuque, Iowa. 1158 pp.
- Munoz-Quesada, F.J. and R.W. Holzenthal. 2008. Revision of the Nearctic species of the caddisfly genus *Wormaldia* McLachlan (Trichoptera : Philopotamidae). ZOOTAXA 1838: 1-75.
- Resolution Copper Mining (Resolution). 2013a. General Plan of Operations: Volume 1, Environmental Setting and Project Description. November 2013.
- _____. 2013b. Plan of Operations; Baseline Hydrologic & Geotechnical Data Gathering Activities on Tonto National Forest, Revised (*In Prep*). [Draft document submitted to Tonto National Forest in June, 2013]. Resolution Copper Mining, LLC, Superior Arizona
- Richard, S.M. 1998. Geologic Map of portions of the Globe 30'x60' Quadrangle, Arizona: Digital Information Series DI-13, version 1.0, Arizona Geologic Survey.
- Southwest Environmental Information Network (SEINet). 2014. Herbarium database information system. Available at: <http://seinet.asu.edu/seinet/index.php>. Accessed June 2013 and February 2014.
- Spencer, J.E., Richard, S.M., and Pearthree, P.A., 1998, Geologic Map of the Mesa 30'x60' Quadrangle, Arizona: Digital Information Series DI-11, version 1.0, Arizona Geological Survey.
- Tonto National Forest (TNF) 2000. Species abstracts. Available at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_018579.pdf Accessed multiple dates June 2013.
- Turner, R.M., J.E. Bowers, and T.L. Burgess. 1995. Sonoran Desert Plants: An Ecological Atlas. The University of Arizona Press. Tucson, Arizona.
- Turner, R. M and D. E. Brown. 1982. Sonoran Desertscrub. Pp. 181-221 *in* D. E. Brown (Ed.). Biotic Communities of the American Southwest – United States and Mexico. Desert Plants, Vol. 4 (1-4): 1-342.
- U.S. Fish and Wildlife Service (USFWS). 1994. Lesser long-nosed bat Recovery Plan. Report prepared by T.H. Fleming for USFWS Region 2, Albuquerque, New Mexico. USFWS, Arizona Ecological Services State Office, Phoenix, Arizona.
- _____. 2011. Genetic analysis splits desert tortoise into two species. Available at http://www.usgs.gov/newsroom/article.asp?ID=2842#.UbYzINzn_5o. Accessed June 10, 2013.
- _____. 2014. USFWS Critical Habitat Portal. Available at: <http://ecos.fws.gov/crithab/>. Accessed February 2014.
- Welsh, S.L., M. Licher. 2010. *Pediomelum* Rydyberg (Leguminosae) in Arizona and two previously undescribed species. Western North American Naturalist 70: 9-18.

- WestLand Resources Inc. (WestLand). 2012a. Wetland plant survey of springs in the Resolution Project Area. Prepared for Resolution Copper Mining by WestLand Resources Inc.
- _____. 2012b. 2011 Bat Species Survey of the Resolution Copper Mine Study Area. Prepared for Resolution Copper Mining by WestLand Resources Inc.
- _____. 2012c. 2011 Raptor surveys of mine area and vicinity, Resolution Copper Company. Prepared for Resolution Copper Mining by WestLand Resources Inc.
- _____. 2013a. Biological Evaluation of the Near West Analysis Area. Prepared for Resolution Copper Mining by WestLand Resources Inc.
- _____. 2013b. Results of bird surveys conducted at Near West 2013. Prepared for Resolution Copper Mining by WestLand Resources Inc.
- _____. 2014a. Jurisdictional waters determination for the Near West analysis area, Pinal County, Arizona. Prepared for: U.S. Army Corps of Engineers and Resolution Copper Mining by WestLand Resources, Inc. January.
- _____. 2014b, In Prep. Addendum to the Vegetation Association Map of the Baseline Activities Area, Pinal County, Arizona. Prepared for Resolution Copper Mining by WestLand Resources Inc.
- _____. 2014c, Results of Sonoran Desert tortoise survey in the Tonto National Forest near Superior, Arizona 2013. Draft report prepared for Resolution Copper Company.
- _____. 2014d. Biological Resources Monitoring Plan: Baseline Hydrologic & Geotechnical Data Gathering Activities on Tonto National Forest Pinal County, Arizona. Prepared for Resolution Copper Mining by WestLand Resources Inc.



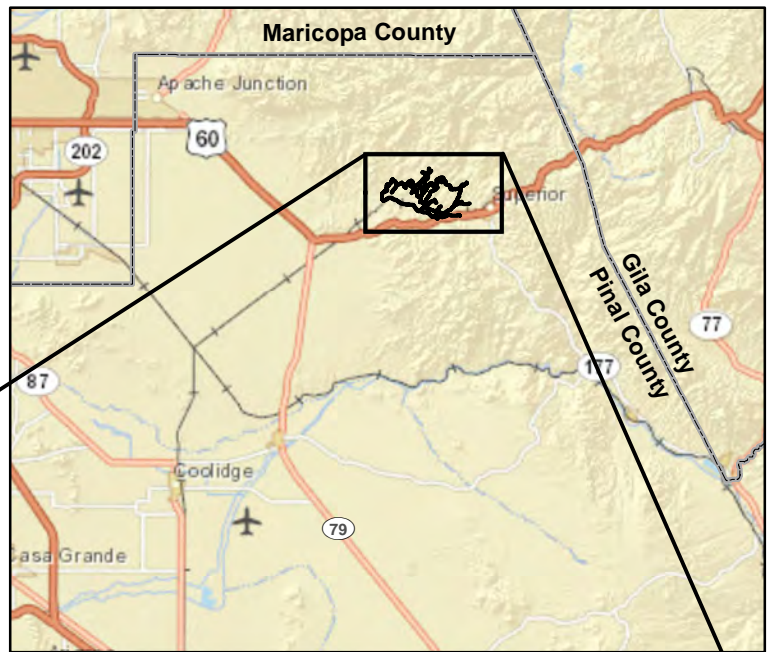
FIGURES

ARIZONA






BASELINE
ACTIVITIES
AREA

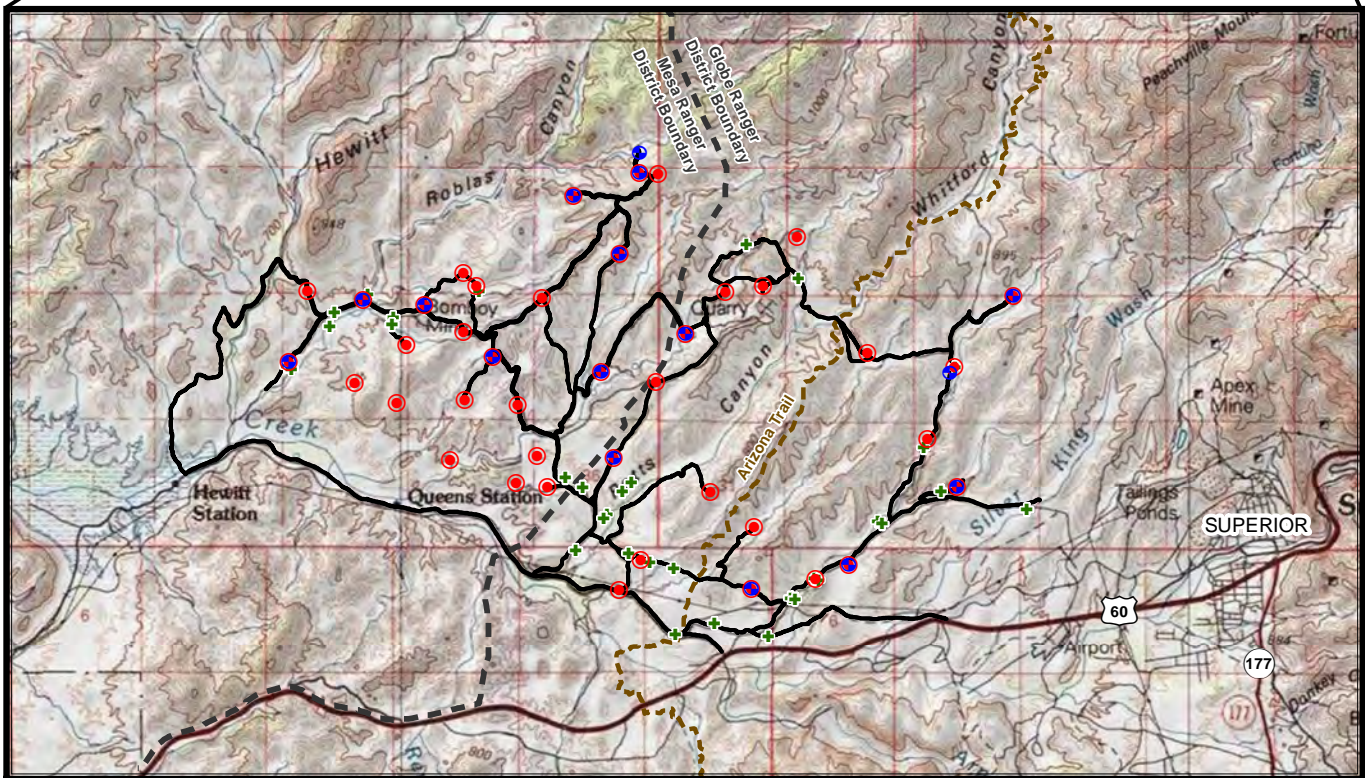
PORTION OF PINAL COUNTY



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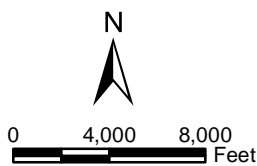
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-  Geotechnical Drill Site
-  Test Trench Site

Approximate Scale 1 Inch = 15 Miles



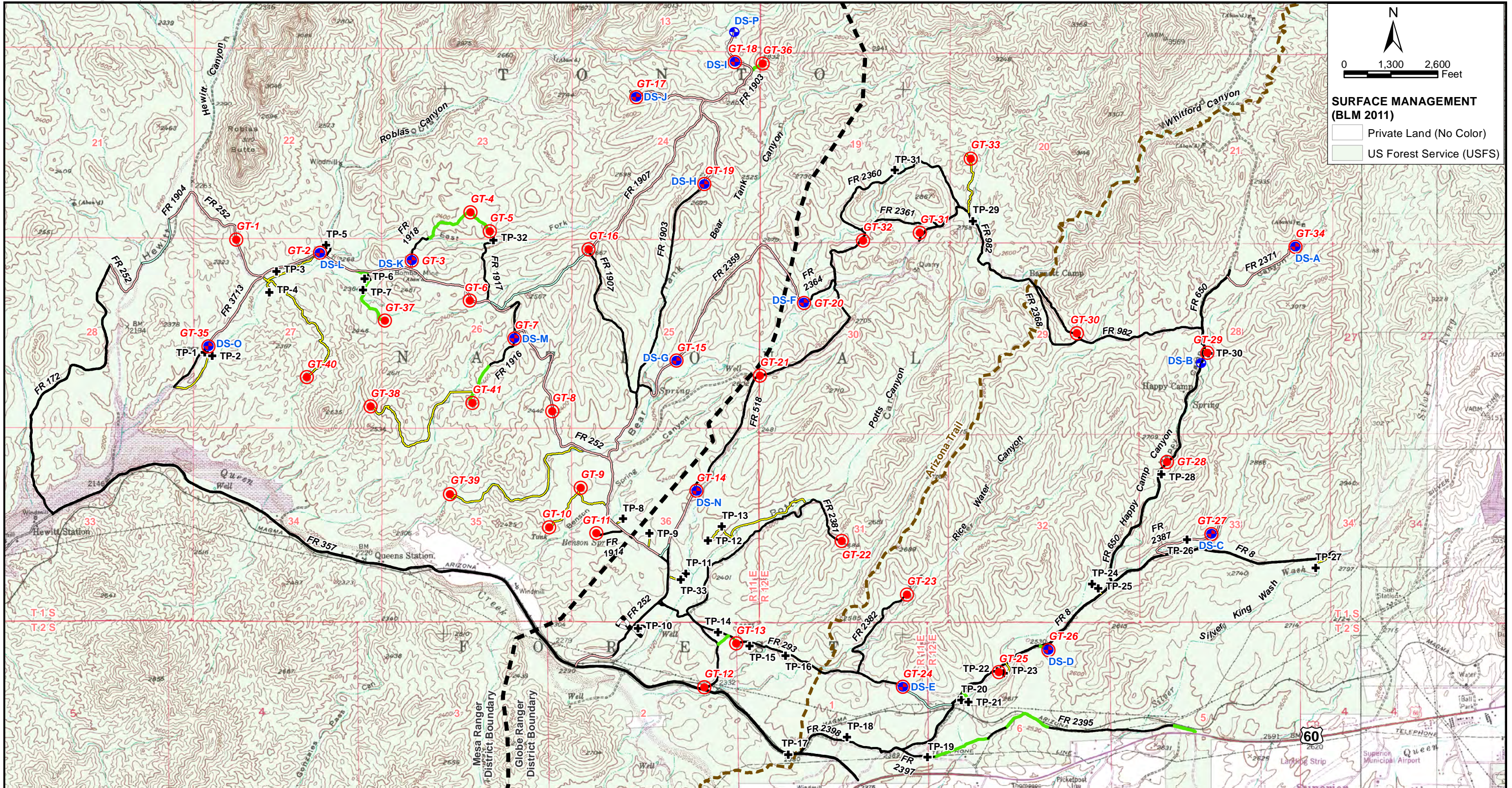
T1S, R11E, Portion of Sections 13, 21-28, & 33-36,
 T1S, R12E, Portion of Sections 19-21, 28-34,
 T2S, R11E, Portion of Sections 1, 2, & 3,
 T2S, R12E, Portion of Sections 5 & 6,
 Pinal County, Arizona,
 Mesa 1:100,000 USGS Quadrangle
 ESRI Online & USFS Data


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RESOLUTION COPPER MINING, LLC
 Baseline Activities
 Biological Evaluation

VICINITY MAP
 Figure 1



0 1,300 2,600 Feet

SURFACE MANAGEMENT (BLM 2011)

- Private Land (No Color)
- US Forest Service (USFS)

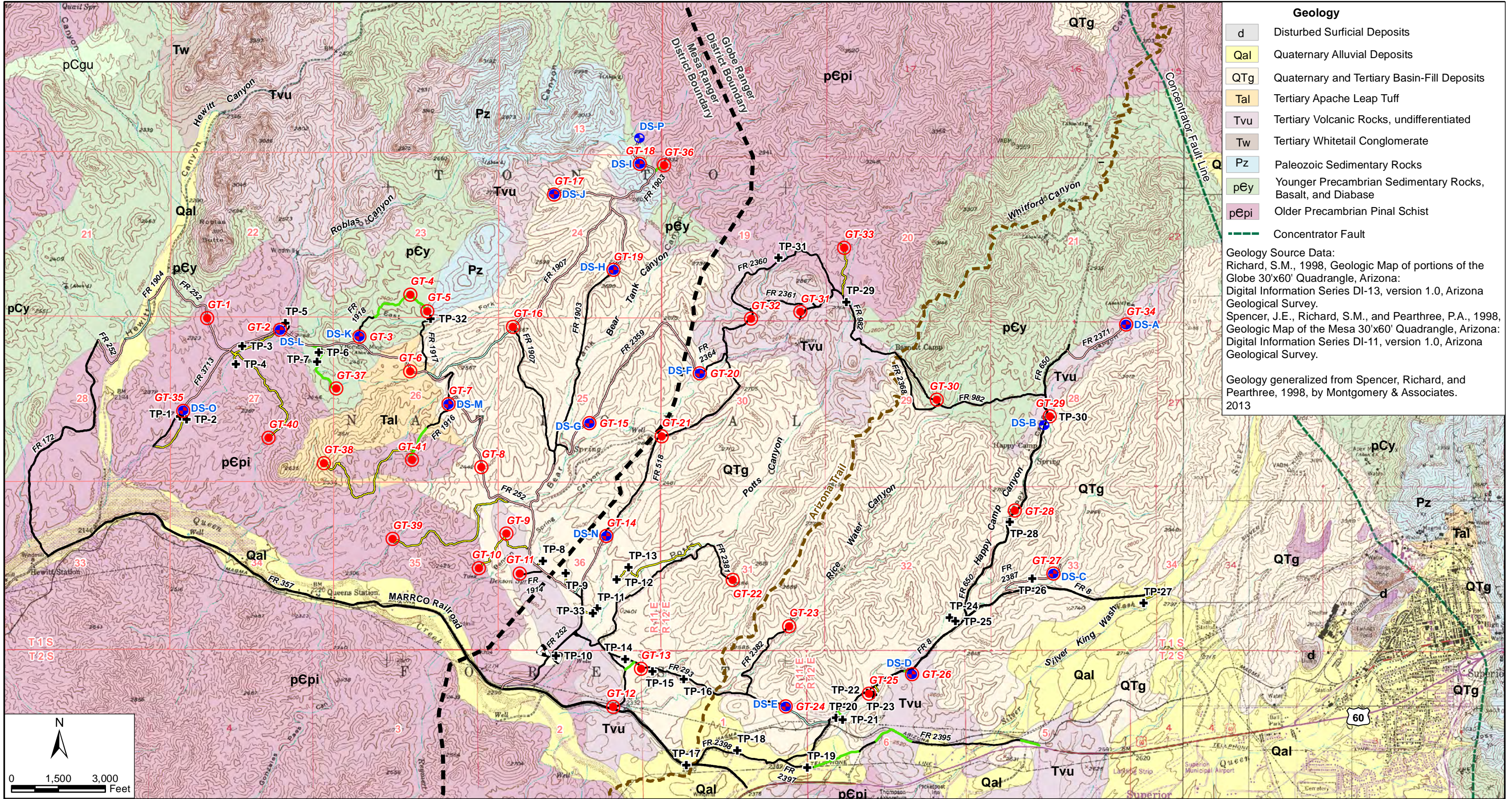
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 T1S, R12E, Portion of Sections 19-21, 28-34,
 T2S, R11E, Portion of Sections 1, 2, & 3,
 T2S, R12E, Portion of Sections 5 & 6,
 Pinal County, Arizona,
 Picketpost Mountain USGS 7.5' Quadrangle



Legend

Monitoring Well Drill Site (DS-A through DS-P)	Forest Service Road (FR) To Be Used For Project Access - No Improvement Required	Previously Disturbed Area To Be Used As Temporary Access Road - No Improvement Required	Short-term Temporary Access Road
Geotechnical Drill Site (GT-1 through GT-41)	Forest Service Road (FR) To Be Improved	Previously Disturbed Area To Be Used As Temporary Access Road - To Be Improved	Laydown Yard
Test Trench Site (TP-1 through TP-33)			Tonto National Forest Ranger District Boundary
			Arizona Trail (ESRI Online Data)

RESOLUTION COPPER MINING, LLC
 Baseline Activities
 Biological Evaluation
 PROPOSED ACTIVITIES, ACCESS,
 AND LAND OWNERSHIP
 Figure 2



Geology

- d Disturbed Surficial Deposits
- Qal Quaternary Alluvial Deposits
- QTg Quaternary and Tertiary Basin-Fill Deposits
- Tal Tertiary Apache Leap Tuff
- Tvu Tertiary Volcanic Rocks, undifferentiated
- Tw Tertiary Whitetail Conglomerate
- Pz Paleozoic Sedimentary Rocks
- pEy Younger Precambrian Sedimentary Rocks, Basalt, and Diabase
- pEpi Older Precambrian Pinal Schist
- Concentrator Fault

Geology Source Data:
 Richard, S.M., 1998, Geologic Map of portions of the Globe 30'x60' Quadrangle, Arizona: Digital Information Series DI-13, version 1.0, Arizona Geological Survey.
 Spencer, J.E., Richard, S.M., and Pearthree, P.A., 1998, Geologic Map of the Mesa 30'x60' Quadrangle, Arizona: Digital Information Series DI-11, version 1.0, Arizona Geological Survey.
 Geology generalized from Spencer, Richard, and Pearthree, 1998, by Montgomery & Associates. 2013

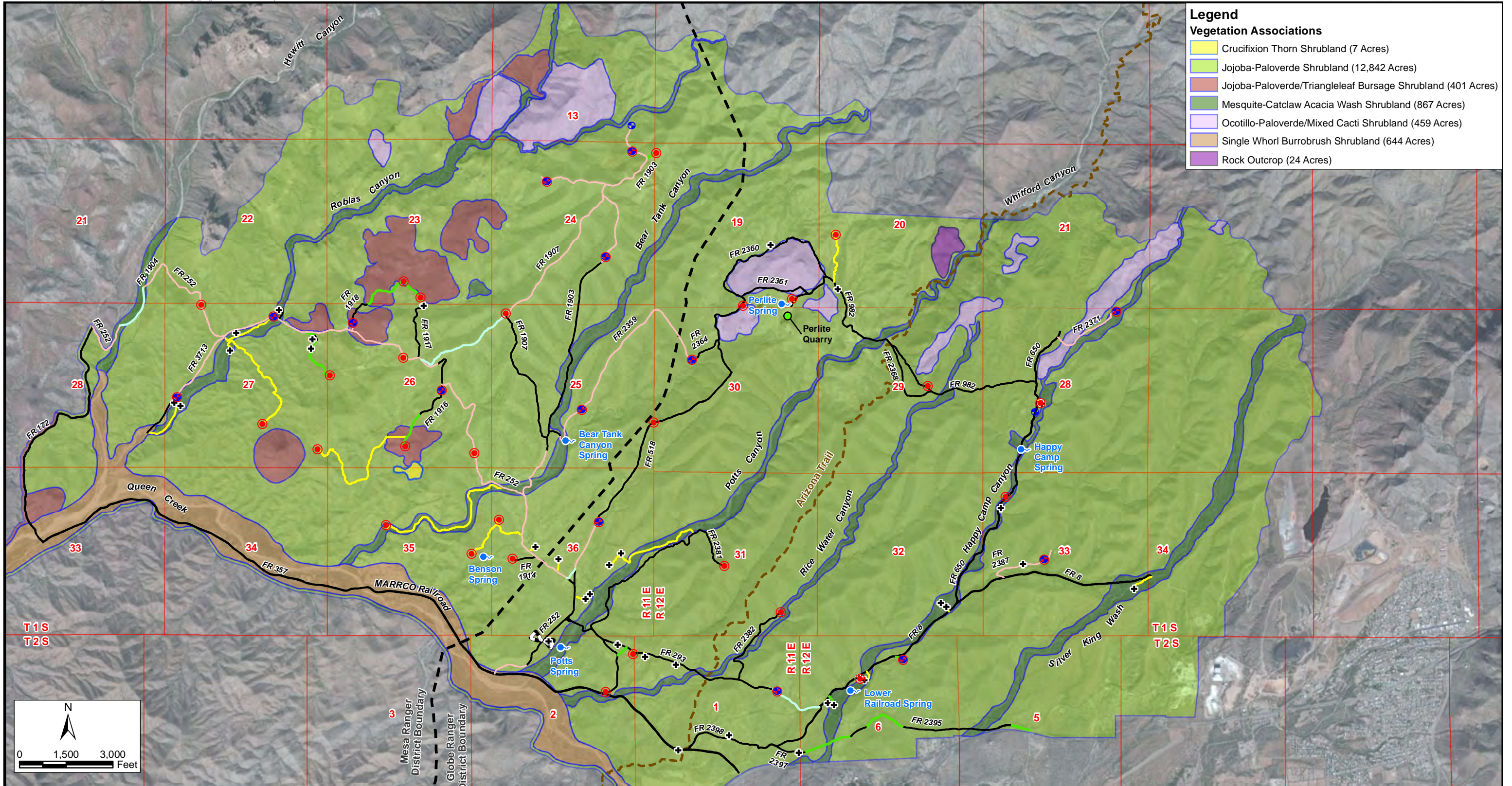
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 T2S, R12E, Portion of Sections 5 & 6,
 Pinal County, Arizona,
 Picketpost Mountain & Superior USGS 7.5' Quadrangles

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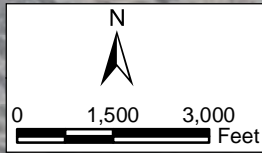
- Monitoring Well Drill Site (DS-A through DS-P)
- Geotechnical Drill Site (GT-1 through GT-41)
- ⊕ Test Trench Site (TP-1 through TP-33)
- Forest Service Road (FR) To Be Used For Project Access
- No Improvement Required
- To Be Improved
- Previously Disturbed Area To Be Used As Temporary Access Road
- No Improvement Required
- To Be Improved
- Short-term Temporary Access Road
- Laydown Yard
- Tonto National Forest Ranger District Boundary
- Arizona Trail (ESRI Online Data)

RESOLUTION COPPER MINING, LLC
 Baseline Activities
 Biological Evaluation
 PROPOSED ACTIVITIES, ACCESS,
 AND SURFICIAL GEOLOGY
 Figure 3



Legend
Vegetation Associations

- Crucifixion Thorn Shrubland (7 Acres)
- Jojoba-Paloverde Shrubland (12,842 Acres)
- Jojoba-Paloverde/Triangleleaf Bursage Shrubland (401 Acres)
- Mesquite-Catclaw Acacia Wash Shrubland (867 Acres)
- Ocotillo-Paloverde/Mixed Cacti Shrubland (459 Acres)
- Single Whorl Burrobrush Shrubland (644 Acres)
- Rock Outcrop (24 Acres)



T1S, R11E, Portion of Sections 13, 21-28, & 33-36,
 T1S, R12E, Portion of Sections 19-21, 28-34,
 T2S, R11E, Portion of Sections 1, 2, & 3,
 T2S, R12E, Portion of Sections 5 & 6,
 Pinal County, Arizona,
 Image Source: ESRI Online Microsoft, November 1, 2010.



Legend

+ Monitoring Well Drill Site	Forest Service Road (FR) To Be Used For Project Access	Previously Disturbed Area To Be Used As Temporary Access Road	 Short-term Temporary Access Road
● Geotechnical Drill Site	— No Improvement Required	— No Improvement Required	Laydown Yard
+ Test Trench Site	 To Be Improved	 To Be Improved	 Tonto National Forest Ranger District Boundary
● Spring			 Arizona Trail (ESRI Online Data)

RESOLUTION COPPER MINING, LLC
 Baseline Activities
 Biological Evaluation
 PROPOSED ACTIVITIES, ACCESS,
 VEGETATION COMMUNITIES
 AND AQUATIC RESOURCES
 Figure 4

APPENDIX A

REPRESENTATIVE PHOTOGRAPHS OF VEGETATION ASSOCIATIONS



Photo 1. Jojoba-Paloverde Shrubland

This association is widespread within the Proposed Action Area, occurring on a wide range of soil types, aspects, and landforms.



Photo 2. Jojoba-Paloverde Shrubland

Photo showing difference in density between foothill paloverde and jojoba on east (far right side of photo) and west aspects (left side of photo).



Photo 3. Jojoba-Paloverde Shrubland

Creosotebush, paloverde, bursage and cacti on an alluvial terrace with relatively deep, calcareous soil.



Photo 4. Ocotillo-Paloverde/mixed Cacti Shrubland

This association is limited to Paleozoic outcrops in the northwestern portion of the Proposed Action Area (as seen in this photo), and a few hillsides of Tertiary volcanic rock around Perlite Spring.



Photo 5. Ocotillo-Paloverde/Mixed Cacti Shrubland

Note dense understory of Cochise cloakfern (plants with grayish appearance).



Photo 6. Sotol

Sotol occurring in dense numbers on exposed Paleozoic limestone. Areas such as this are few within the Proposed Action Area.



Photo 7. Jojoba-Paloverde/Triangleaf Bursage Shrubland

A dense stand of saguaros occurring within a jojoba-paloverde-triangleaf bursage shrubland. This association often appeared on reddish soils derived from Precambrian rocks.



Photo 8. Jojoba-Paloverde/Triangleaf Bursage Shrubland

The perennial forbs woody crinklemat and desert zinnia on exposed tuff near the Bomboy mine.



Photo 9. Single Whorl Burrobrush Shrubland

This vegetation association grows in the middle of the channel in some reaches of Queen Creek.



Photo 10. Mesquite-Catclaw Acacia Wash

This association is widespread throughout the xero-riparian drainages in the vicinity of the Proposed Action Area.



Photo 11. Rock outcrop

This association has an isolated occurrence on the sandstone outcrop west of Pott's Canyon. The bright green shrub is hopbush.



Photo 12. Crucifixion Thorn Shrubland

This association is present in one location, where it is found on a hill composed of a loamy soil.

APPENDIX B

**TONTO NATIONAL
FOREST FEDERAL
THREATENED,
ENDANGERED,
AND CANDIDATE
SPECIES;
AND FOREST
SENSITIVE SPECIES**

Tonto National Forest
Federal Threatened, Endangered, and Candidate Species
May 2012¹

Common Name	Scientific Name	Status
Mammals		
Bat, lesser long-nosed	<i>Leptonycteris curasoae yerbabuena</i>	E
Birds		
Cuckoo, yellow-billed	<i>Coccyzus americanus</i>	PT
Flycatcher, southwestern willow	<i>Empidonax traillii extimus</i>	E
Flycatcher, southwestern willow critical habitat	N/A	D
Owl, Mexican spotted	<i>Strix occidentalis lucida</i>	T
Owl, Mexican spotted critical habitat	N/A	D
Rail, Yuma clapper	<i>Rallus longirostris yumanensis</i>	E
Reptiles		
Gartersnake, northern Mexican	<i>Thamnophis eques megalops</i>	PT
Gartersnake, northern Mexican critical habitat	N/A	P
Gartersnake, Narrow-headed	<i>Thamnophis rufipunctatus</i>	PT
Gartersnake, Narrow-headed critical habitat	N/A	P
Tortoise, Morafka's desert	<i>Gopherus morafkai</i>	C
Amphibian		
Frog, Chiricahua leopard	<i>Lithobates [Rana] chiricahuensis</i>	T
Frog, Chiricahua leopard, critical habitat	N/A	D
Fish		
Chub, Gila	<i>Gila intermedia</i>	E
Chub, Gila critical habitat	N/A	D
Chub, headwater	<i>Gila nigra</i>	C
Chub, roundtail	<i>Gila robusta</i>	C
Minnow, loach	<i>Tiaroga cobitis</i>	E
Minnow, loach, critical habitat	N/A	D
Pikeminnow, Colorado (non-essential experimental)	<i>Ptychocheilus lucius</i>	E
Pupfish, desert	<i>Cyprinodon macularius</i>	E
Spikedace	<i>Meda fulgida</i>	E
Spikedace, critical habitat	N/A	D
Sucker, razorback	<i>Xyrauchen texanus</i>	E
Sucker, razorback, critical habitat	N/A	D
Topminnow, Gila	<i>Poeciliopsis occidentalis occidentalis</i>	E
Trout, Gila	<i>Oncorhynchus gilae</i>	T
Woundfin	<i>Plagopterus argentissimus</i>	E
Plants		
Cliffrose, Arizona	<i>Purshia subintegra</i>	E
Hedgehog, Arizona	<i>Echinocereus triglochidiatus var. arizonicus</i>	E
C=candidate, D-designated, E=endangered, N/A=not applicable, P=proposed, T=threatened		

¹ Modified based on recently published USFWS final and proposed rules in the Federal Register as of February 2014

Tonto National Forest
Forest Sensitive Species (includes Federal candidate species)
Mar 2011

Common Name	Scientific Name
Mammals	
Bat, Allen's lappet-browed	<i>Idionycteris phyllotis</i>
Bat, California leaf-nosed	<i>Macrotus californicus</i>
Bat, greater western mastiff	<i>Eumops perotis californicus</i>
Bat, pale townsend's big-eared	<i>Corynorhinus townsendii pallescens</i>
Bat, pocketed free-tailed	<i>Nyctinomops femorosaccus</i>
Bat, spotted	<i>Euderma maculatum</i>
Bat, western red	<i>Lasiurus blossevillii</i>
Coati, white-nosed	<i>Nasua narica</i>
Sheep, desert bighorn	<i>Ovis canadensis mexicana</i>
Sheep, rocky mountain bighorn	<i>Ovis canadensis canadensis</i>
Birds	
Blackhawk, common	<i>Buteogallus anthracinus</i>
Cuckoo, western yellow-billed*	<i>Coccyzus americanus occidentalis</i>
Eagle, bald	<i>Haliaeetus leucocephalus</i>
Falcon, American peregrine	<i>Falco peregrinus anatum</i>
Goshawk, northern	<i>Accipiter gentilis</i>
Grebe, Clark's	<i>Aechmophorus clarkii</i>
Hawk, northern gray	<i>Asturina nitida maximus</i>
Hawk, zone-tailed	<i>Buteo albonotatus</i>
Towhee, Abert's	<i>Pipilo aberti</i>
Reptiles	
Gartersnake, northern Mexican*	<i>Thamnophis eques megalops</i>
Gartersnake, Narrow-headed*	<i>Thamnophis rufipunctatus</i>
Monster, reticulate Gila monster	<i>Heloderma suspectum suspectum</i>
Snake, Maricopa leaf-nosed	<i>Phyllorhynchus browni lucidus</i>
Tortoise, Morafka's desert*	<i>Gopherus morafkai</i>
Amphibians	
Frog, lowland leopard	<i>Rana yavapaiensis</i>
Frog, northern leopard	<i>Rana pipiens</i>
Frog, western barking	<i>Eleutherodactylus augusti cactorum</i>
Toad, Arizona	<i>Bufo microscaphus</i>
Fish	
Chub, headwater*	<i>Gila nigra</i>
Chub, roundtail*	<i>Gila robusta</i>
Dace, longfin	<i>Agosia chrysogaster</i>
Sucker, desert	<i>Catostomus clarki</i>
Sucker, Sonora	<i>Catostomus insignis</i>
Invertebrates	
Beetle, Parker's cilloepus riffle	<i>Cylloepus parkeri</i>
Midge, netwing	<i>Agathon arizonicus</i>
Springsnail, fossil	<i>Pyrgulopsis simplex</i>
Plants	
Agave, Hohokam	<i>Agave murpheyi</i>
Agave, Tonto basin	<i>Agave delamateri</i>
Buckwheat, Ripley wild	<i>Eriogonum ripleyi</i>
Bugbane, Arizona	<i>Cimicifuga arizonica</i>

Common Name	Scientific Name
Dock, blumer's	<i>Rumex orthoneurus</i>
Fleabane, fish creek	<i>Erigeron piscaticus</i>
Fleabane, Mogollon	<i>Erigeron anchana</i>
Groundsel, toumey	<i>Packera neomexicana</i> var. <i>toumeyi</i> (= <i>Senecio</i> n. var. <i>t.</i>)
Mallow, Pima Indian	<i>Abutilon parishii</i>
Milkwort, Hualapai	<i>Polygala rusbyi</i>
Phlox, Arizona	<i>Phlox amabilis</i>
Rockdaisy, fish creek	<i>Perityle saxicola</i>
Rockdaisy, salt river	<i>Perityle gilensis</i> var. <i>salensis</i>
Root, Arizona alum	<i>Heuchera glomerulata</i>
Root, eastwood alum	<i>Heuchera eastwoodiae</i>
Sage, galiuro	<i>Salvia amissa</i>
Sandwort, Mt. Dellenbaugh	<i>Arenaria aberrans</i>
Sedge, Chihuahuan	<i>Carex chihuahuensis</i>
Sedge, Cochise	<i>Carex ultra</i> (= <i>C. spissa</i> var. <i>ultra</i>)
Snapdragon, mapleleaf false	<i>Mabrya acerifolia</i> (= <i>Maurandya a.</i>)
Vetch, horseshoe deer	<i>Lotus mearnsii</i> var. <i>equisolensis</i>
Woodfern, Aravaipa	<i>Thelypteris puberula</i> var. <i>sonorensis</i>
* also a federal candidate species.	

APPENDIX C

**U.S. FOREST
SERVICE (2013)
REGION 3
REGIONAL
FORESTER'S
SENSITIVE PLANT
AND ANIMAL
SPECIES**

USFS R3 REGIONAL FORESTER'S SENSITIVE SPECIES: PLANTS - 2013

Common Name	Scientific Name	Forest(s)
TUFTED SAND VERBENA	<i>Abronia bigelovii</i>	CAR, SFE
PIMA INDIAN MALLOW	<i>Abutilon parishii</i>	COR, TON
WRIGHT'S DOGWEEED	<i>Adenophyllum wrightii</i> var. <i>wrightii</i>	GIL
TONTO BASIN AGAVE	<i>Agave delamateri</i>	COC, PRE, TON
HOHOKAM AGAVE	<i>Agave murpheyi</i>	TON
SANTA CRUZ STRIPED AGAVE	<i>Agave parviflora</i> ssp. <i>parviflora</i>	COR
PHILLIPS' AGAVE	<i>Agave phillipsiana</i>	COC, PRE
TRELEASE AGAVE	<i>Agave schottii</i> var. <i>treleasei</i>	COR
SACRED MOUNTAIN AGAVE	<i>Agave verdensis</i>	COC
PAGE SPRINGS AGAVE	<i>Agave yavapaiensis</i>	COC
GOODDING'S ONION	<i>Allium gooddingii</i>	A-S, COR, GIL, LIN
SAIYA	<i>Amoreuxia gonzalezii</i>	COR
LARGE-FLOWERED BLUE STAR	<i>Amsonia grandiflora</i>	COR
MOGOLLON DEATH CAMAS	<i>Anticlea mogollonensis</i> (= <i>Zigadenus</i> m.)	GIL
CHAPLINE'S COLUMBINE	<i>Aquilegia chaplinei</i> (= <i>A. chrysantha</i> var. <i>chaplinei</i>)	LIN
CHIRICAHUA ROCK CRESS	<i>Arabis tricornuta</i>	COR
MT. DELLENBAUGH SANDWORT	<i>Arenaria aberrans</i>	COC, KAI, PRE, TON
LEMMON MILKWEED	<i>Asclepias lemmonii</i>	COR
GREENE MILKWEED	<i>Asclepias uncialis</i> ssp. <i>uncialis</i>	A-S, CIB, COR, GIL, PRE, SFE
ZUNI MILKVETCH	<i>Astragalus accumbens</i>	CIB
GUMBO MILKVETCH	<i>Astragalus ampullarius</i>	KAI
TALL MILKVETCH	<i>Astragalus altus</i>	LIN
MAGUIRE'S (COPPERMINE) MILKVETCH	<i>Astragalus cobrensis</i> var. <i>maguirei</i>	COR
MARBLE CANYON MILKVETCH	<i>Astragalus cremnophylax</i> var. <i>hevronii</i>	KAI
CLIFF MILKVETCH	<i>Astragalus cremnophylax</i> var. <i>myriorrhaphis</i>	KAI
VILLOUS GROUNDCOVER MILKVETCH	<i>Astragalus humistratus</i> var. <i>crispulus</i>	A-S, CIB, GIL
HUACHUCA MILKVETCH	<i>Astragalus hypoxylus</i>	COR
KERR'S MILKVETCH	<i>Astragalus kerrii</i>	LIN
CHACO MILKVETCH	<i>Astragalus micromerius</i>	CIB, SFE
PAGOSA MILKVETCH	<i>Astragalus missouriensis</i> var. <i>humistratus</i>	CAR
RIPLEY MILKVETCH	<i>Astragalus ripleyi</i>	CAR
RUSBY'S MILKVETCH	<i>Astragalus rusbyi</i>	COC, KAI
ONE-FLOWERED MILKVETCH	<i>Astragalus wittmannii</i>	CIB
AYENIA	<i>Ayenia jaliscana</i> (= <i>A. truncata</i>)	COR
SIERRA BLANCA KITTENTAILS	<i>Besseyia oblongifolia</i>	LIN
CRENULATE MOONWORT	<i>Botrychium crenulatum</i>	COC
BUSH-VIOLET	<i>Browallia eludens</i>	COR
PECOS MARIPOSA LILY	<i>Calochortus gunnisonii</i> var. <i>perpulcher</i>	SFE
CHILTEPIN	<i>Capsicum annuum</i> var. <i>glabriusculum</i>	COR
CHIHUAHUAN SEDGE	<i>Carex chihuahuensis</i>	COR, TON

COCHISE SEDGE	<i>Carex ultra</i> (=C.spissa var. ultra)	COC, COR, PRE, TON
KAIBAB PAINTBRUSH	<i>Castilleja kaibabensis</i>	KAI
WHITE MOUNTAINS PAINTBRUSH	<i>Castilleja mogollonica</i>	A-S
TRANS-PECOS INDIAN PAINTBRUSH	<i>Castilleja nervata</i>	COR
SANTA CRUZ STAR LEAF	<i>Choisya mollis</i>	COR
TUSAYAN RABBITBRUSH, DISTURBED RABBITBRUSH	<i>Chrysothamnus molestus</i>	COC, KAI
ARIZONA BUGBANE	<i>Cimicifuga arizonica</i>	COC, KAI, TON
GILA THISTLE	<i>Cirsium gilense</i>	A-S, GIL
MOGOLLON THISTLE	<i>Cirsium parryi</i> ssp. mogollonicum	COC
WRIGHT'S MARSH THISTLE	<i>Cirsium wrightii</i>	LIN
ARIZONA LEATHERFLOWER, CLUSTERED LEATHERFLOWER	<i>Clematis hirsutissima</i> var. <i>hirsutissima</i>	CAR, CIB, COC, LIN, KAI, SFE (Sensitive only for AZ forests)
MEXICAN HEMLOCK PARSLEY	<i>Conioselinum mexicanum</i>	COR
SANTA CRUZ BEEHIVE CACTUS	<i>Corypantha recurvata</i>	COR
SMOOTH BABYBONNETS	<i>Coursetia glabella</i>	COR
WOOTON'S HAWTHORN	<i>Crategus wootoniana</i>	GIL, LIN
YELLOW LADY'S-SLIPPER	<i>Cypripedium parviflorum</i> var. <i>pubescens</i> (=C. calceolus var. <i>pubescens</i> , C. <i>pubescens</i>)	A-S, CAR, GIL, LIN, SFE
GENTRY INDIGO BUSH	<i>Dalea tentaculoides</i>	COR
ALPINE LARKSPUR	<i>Delphinium alpestre</i>	CAR
ROBUST LARKSPUR	<i>Delphinium robustum</i>	CAR, SFE
METCALFE'S TICK-TREFOIL	<i>Desmodium metcalfei</i>	COC, COR, PRE, GIL
HEIL'S ALPINE WHITLOWGRASS	<i>Draba heilii</i>	SFE
SMALL-HEADED GOLDENWEED	<i>Ericameria microcephala</i> (=Haplopappus m.)	CAR
GUADALUPE RABBITBRUSH	<i>Ericameria nauseosa</i> var. <i>texensis</i> (=Chrysothamnus n. ssp t.)	LIN
MOGOLLON FLEABANE	<i>Erigeron anchana</i>	TON
ARID THRONE FLEABANE	<i>Erigeron arisolius</i>	COR
HELIOGRAPH PEAK FLEABANE	<i>Erigeron heliographis</i>	COR
HESS' FLEABANE	<i>Erigeron hessii</i>	GIL
CHIRICAHUA FLEABANE	<i>Erigeron kuschei</i>	COR
FISH CREEK FLEABANE	<i>Erigeron piscaticus</i>	TON
ROCK FLEABANE	<i>Erigeron saxatilis</i>	COC, KAI, PRE
SIVINSKI'S FLEABANE	<i>Erigeron sivinskii</i>	CIB
PECOS FLEABANE	<i>Erigeron subglaber</i>	CAR, SFE
HEATHLEAF WILD BUCKWHEAT	<i>Eriogonum ericifolium</i> var. <i>ericifolium</i>	A-S, COC, PRE
MORTON WILD BUCKWHEAT	<i>Eriogonum mortonianum</i>	KAI
RIPLEY WILD BUCKWHEAT	<i>Eriogonum ripleyi</i>	COC, PRE, TON
ATWOOD WILD BUCKWHEAT	<i>Eriogonum thompsonae</i> var. <i>atwoodii</i>	KAI

VILLARD'S PINCUSHION CACTUS	<i>Escobaria villardii</i>	LIN
WISLIZENI GENTIAN	<i>Gentianella wislizeni</i>	A-S, COR
SHOOTINGSTAR GERANIUM	<i>Geranium dodecatheoides</i>	LIN
BARTRAM STONECROP	<i>Graptopetalum bartramii</i>	COR
FLAGSTAFF PENNYROYAL	<i>Hedeoma diffusum</i>	COC, KAI, PRE
ARIZONA SNEEZEWEED	<i>Helenium arizonicum</i>	A-S, COC
ARIZONA SUNFLOWER	<i>Helianthus arizonensis</i>	A-S, COC
RUTTER'S FALSE GOLDENASTER	<i>Heterotheca rutteri</i>	COR
EASTWOOD ALUM ROOT	<i>Heuchera eastwoodiae</i>	A-S, COC, PRE, TON
ARIZONA ALUM ROOT	<i>Heuchera glomerulata</i>	A-S, COR, TON
SANDIA ALUM ROOT	<i>Heuchera pulchella</i>	CIB
CAPITAN PEAK ALUMROOT	<i>Heuchera woodsiaephila</i>	LIN
COLEMAN'S CRESTED CORALROOT	<i>Hexalectris colemanii</i>	COR
CHISOS MT. CRESTED CORALROOT	<i>Hexalectris revoluta</i>	LIN
WOOTON'S ALUMROOT	<i>Heuchera wootonii</i>	LIN
ARIZONA CORALROOT	<i>Hexalectris spicata</i> var. <i>arizonica</i>	COR, GIL, LIN
TEXAS PURPLE-SPIKE	<i>Hexalectris warnockii</i>	COR
MOGOLLON HAWKWEED	<i>Hieracium brevipilum</i> (= <i>H. fendleri</i> var. <i>mogollense</i>)	A-S, GIL
RUSBY HAWKWEED	<i>Hieracium abscissum</i> (= <i>H. rusbyi</i>)	COR, GIL
NEW MEXICO BITTERWEED	<i>Hymenoxys ambigens</i> var. <i>neomexicana</i>	COR
TALL BITTERWEED	<i>Hymenoxys brachyactis</i>	CIB
SIERRA BLANCA CLIFF DAISY	<i>Ionactis elegans</i> (= <i>Chaetopappa</i> e.)	LIN
KAIBAB BLADDERPOD	<i>Lesquerella kaibabensis</i>	KAI
LEMON LILY	<i>Lilium parryi</i>	COR
WOOD LILY	<i>Lilium philadelphicum</i>	LIN, SFE
CHIRICAHUA MUDWORT	<i>Limosella pubiflora</i>	COR
ALAMOS DEER VETCH	<i>Lotus alamosanus</i>	COR
HORSESHOE DEER VETCH	<i>Lotus mearnsii</i> var. <i>equisolensis</i>	TON
HUACHUCA MOUNTAINS LUPINE	<i>Lupinus huachucanus</i>	COR
BROADLEAF LUPINE	<i>Lupinus latifolius</i> ssp. <i>leucanthus</i>	PRE
LEMMON'S LUPINE	<i>Lupinus lemmonii</i>	COR
MAPLELEAF FALSE SNAPDRAGON	<i>Mabrya acerifolia</i> (= <i>Maurandya</i> a.)	TON
SUPINE BEAN	<i>Macroptilium supinum</i>	COR
ARIZONA MANIHOT	<i>Manihot davisiae</i>	COR
CHAMA BLAZING STAR	<i>Mentzelia conspicua</i>	CAR, SFE
SPRINGER'S BLAZING STAR	<i>Mentzelia springeri</i>	SFE
WIGGINS MILKWEED VINE	<i>Metastelma mexicanum</i> (= <i>Cynanchum wigginsii</i>)	COR
LADIES'-TRESSES	<i>Microthelys rubrocallosa</i> (= <i>Schiedeella</i> r., <i>Spiranthes</i> r.)	LIN
SOUTHWESTERN MUHLY	<i>Muhlenbergia palmeri</i> (= <i>M. dubioides</i>)	COR
SYCAMORE CANYON MUHLY	<i>Muhlenbergia elongata</i> (= <i>M. xerophila</i>)	COR
HEARTLEAF GROUNDSEL	<i>Packera cardamine</i> (= <i>Senecio cardamine</i>)	A-S, GIL
TOUMEY GROUNDSEL	<i>Packera neomexicana</i> var. <i>toumeyi</i> (= <i>Senecio</i> n. var. <i>t.</i>)	COR, TON

SPELLENBERG'S GROUNDSEL	<i>Packera spellenbergii</i> (=Senecio s.)	CIB
VIRLET PASPALUM	<i>Paspalum virletii</i>	COR
ARIZONA PASSIONFLOWER	<i>Passiflora arizonica</i>	COR
BEARDLESS CHINCHWEED	<i>Pectis imberbis</i>	COR
KAIBAB PINCUSHION CACTUS	<i>Pediocactus paradinei</i>	KAI
FICKEISEN PINCUSHION CACTUS ¹	<i>Pediocactus peeblesianus</i> var. <i>flickeisniae</i>	KAI
CHIHUAHUA SCURF-PEA	<i>Pediomelum pentaphyllum</i>	COR
VERDE BREADROOT	<i>Pediomelum verdiensis</i>	COC, PRE, TON
LYNGHOLM'S BRAKEFERN	<i>Pellaea lyngholmii</i>	COC
ALAMO PENSTEMON	<i>Penstemon alamosensis</i>	LIN
GUADALUPE PENSTEMON	<i>Penstemon cardinalis</i> ssp. <i>regalis</i>	LIN
SUNSET CRATER BEARDTONGUE	<i>Penstemon clutei</i>	COC
CATALINA BEARDTONGUE	<i>Penstemon discolor</i>	COR
MAGUIRE'S BEARDTONGUE	<i>Penstemon linarioides</i> ssp. <i>maguirei</i>	A-S, GIL
METCALFE'S PENSTEMON	<i>Penstemon metcalfei</i>	GIL
FLAGSTAFF BEARDTONGUE	<i>Penstemon nudiflorus</i>	COC, KAI, PRE
SAN MATEO PENSTEMON	<i>Penstemon pseudoparvus</i>	CIB
CHIRICAHUA ROCKDAISY	<i>Perityle cochisensis</i>	COR
SALT RIVER ROCKDAISY	<i>Perityle gilensis</i> var. <i>salensis</i>	TON
FISH CREEK ROCKDAISY	<i>Perityle saxicola</i>	TON
CLOUDCROFT SCORPIONWEED	<i>Phacelia cloudcroftensis</i>	LIN
ARIZONA PHLOX	<i>Phlox amabilis</i>	A-S, COC, KAI, PRE, TON
BROADLEAF GROUND CHERRY	<i>Physalis latiphysa</i>	COR
ALCOVE BOG ORCHID	<i>Platanthera zothecina</i>	COC
HINCKLEY'S POLEMONIUM	<i>Polemonium pauciflorum</i> ssp. <i>hinckleyi</i>	COR
HUALAPAI MILKWORT	<i>Polygala rusbyi</i>	COC, PRE, TON
WHITE-FLOWERED CINQUEFOIL	<i>Potentilla albiflora</i>	COR
CHIRICAHUA CINQUEFOIL	<i>Potentilla rhyolitica</i> var. <i>chiricahuensis</i>	COR
HUACHUCA CINQUEFOIL	<i>Potentilla rhyolitica</i> var. <i>rhyolitica</i>	COR
MEXICAN TANSY ASTER	<i>Psilactis gentryi</i> (=machaeranthera mexicana)	COR
WHISK FERN	<i>Psilotum nudum</i>	COR
DAVIDSON'S CLIFF CARROT	<i>Pteryxia davidsonii</i>	A-S, GIL
PARISH'S ALKALI GRASS	<i>Puccinellia parishii</i>	A-S
GRAND CANYON ROSE	<i>Rosa stellata</i> ssp. <i>abyssa</i>	KAI
ERTTER'S ROSE	<i>Rosa woodsii</i> var. <i>ertterae</i>	COC
SIERRA BLANCA CINQUEFOIL	<i>Potentilla sierrae-blancae</i>	LIN
BLUMER'S DOCK	<i>Rumex orthoneurus</i>	A-S, CAR, COC, COR, GIL, LIN, SFE, TON (sensitive only for AZ forests)
ARIZONA WILLOW	<i>Salix arizonica</i>	A-S, CAR, SFE

BEBB'S WILLOW	<i>Salix bebbiana</i>	Several (sensitive only for A-S and COC)
GALIURO SAGE	<i>Salvia amissa</i>	COR, TON
MEARNS SAGE	<i>Salvia dorrii ssp. mearnsii</i>	COC, PRE
CHIRICAHUA MOUNTAIN BROOKWEED	<i>Samolus vagans</i>	COR
MIMBRES FIGWORT	<i>Scrophularia macrantha</i>	GIL
NEW MEXICAN STONECROP	<i>Sedum integrifolium ssp. neomexicana</i>	LIN
HUACHUCA GROUNDSEL	<i>Senecio multidentatus var. huachucanus (=s. huachucanus)</i>	COR
NODDING BLUE-EYED GRASS	<i>Sisyrinchium cernuum</i>	COR
GUADALUPE MOUNTAINS GOLDENROD	<i>Solidago wrightii var. guadalupensis</i>	LIN
GUADALUPE MESCAL BEAN	<i>Sophora gypsophila var. guadalupensis</i>	LIN
PORSILD'S STARWORT	<i>Stellaria porsildii</i>	COR, GIL
LEMMON'S STEVIA	<i>Stevia lemmonii</i>	COR
GUADALUPE JEWELFLOWER	<i>Streptanthus sparsiflorus</i>	LIN
PINOS ALTOS FLAME FLOWER	<i>Talinum humile</i>	COR, GIL
TEPIC FLAME FLOWER	<i>Talinum marginatum</i>	COR
ARAVAIPA WOODFERN	<i>Thelypteris puberula var. sonorensis</i>	COR, TON
SONORAN NOSEBURN	<i>Tragia laciniata</i>	COR
MOGOLLON CLOVER	<i>Trifolium longipes ssp. neurophyllum (=T. neurophyllum)</i>	A-S, GIL
TUMAMOC GLOBEBERRY	<i>Tumamoca macdougallii</i>	COR
SHADE VIOLET	<i>Viola umbraticola</i>	COR

DEFINITIONS	
1	Species is proposed for federal listing, and will be removed from the RFSS list if/once the final rule is published implementing the Federal protections provided by the ESA.
A-S	Apache-Sitgreaves National Forests
CAR	Carson National Forest
CIB	Cibola National Forest
COC	Coconino National Forest
COR	Coronado National Forest
GIL	Gila National Forest
KAI	Kaibab National Forest
KRB	Kiowa/Rita Blanca National Grasslands
LIN	Lincoln National Forest
PRE	Prescott National Forest
SFE	Santa Fe National Forest

USFS R3 REGIONAL FORESTER'S SENSITIVE SPECIES: ANIMALS - 2013

Common Name	Scientific Name	Forest(s)
AMPHIBIANS (7)		
BOREAL TOAD (Western toad)	<i>Anaxyrus boreas boreas</i> (DPS)	CAR
SACRAMENTO MOUNTAINS SALAMANDER	<i>Aneides hardii</i>	LIN
WESTERN BARKING FROG	<i>Craugastor augusti cactorum</i>	COR, TON
HUACHUCA/CANELO HILLS TREEFROG (AZ treefrog)	<i>Hyla wrightorum pop. 2</i>	COR
NORTHERN LEOPARD FROG	<i>Lithobates pipiens</i>	A-S, CAR, CIB, COC, KAI, SFE, TON
TARAHUMARA FROG	<i>Lithobates tarahumarae</i>	COR
LOWLAND LEOPARD FROG	<i>Lithobates yavapaiensis</i>	A-S, COC, COR, GIL, PRE, TON
BIRDS (35)		
NORTHERN GOSHAWK	<i>Accipiter gentilis</i>	A-S, CAR, CIB, COC, COR, GIL, KAI, LIN, PRE, SFE, TON
BOREAL OWL	<i>Aegolius funereus</i>	CAR, SFE
VIOLET-CROWNED HUMMINGBIRD	<i>Amazilia violiceps</i>	COR
BAIRD'S SPARROW	<i>Ammodramus bairdii</i>	A-S, COR, LIN
ARIZONA GRASSHOPPER SPARROW	<i>Ammodramus savannarum ammolegus</i>	COR
BURROWING OWL (Western)	<i>Athene cunicularia hypugaea</i>	A-S, CAR, CIB, COC, GIL, KAI, LIN, SFE
COMMON BLACK HAWK	<i>Buteogallus anthracinus</i>	GIL
LUCIFER HUMMINGBIRD	<i>Calothorax lucifer</i>	COR
COSTA'S HUMMINGBIRD	<i>Calypte costae</i>	GIL
NORTHERN BEARDLESS-TYRANNULET	<i>Camptostoma imberbe</i>	COR (Douglas RD)
BUFF-COLLARED NIGHTJAR	<i>Caprimulgus ridgwayi</i>	COR
MOUNTAIN PLOVER	<i>Charadrius montanus</i>	CIB (KRB)
WESTERN YELLOW BILLED CUCKOO ¹	<i>Coccyzus americanus occidentalis</i>	A-S, CAR, CIB (except BK), COC, COR, GIL, PRE, SFE, TON
COMMON GROUND DOVE	<i>Columbina passerina</i>	GIL
BROAD-BILLED HUMMINGBIRD	<i>Cyananthus latirostris</i>	COR
GRAY CATBIRD	<i>Dumetella carolinensis</i>	A-S
BUFF-BREASTED FLYCATCHER	<i>Empidonax fulvifrons</i>	COR
EARED QUETZAL	<i>Euptilotis neoxenus</i>	COR
AMERICAN PEREGRINE FALCON	<i>Falco peregrinus anatum</i>	A-S, CAR, CIB (except BK), COC, COR, GIL, KAI, LIN, PRE, SFE, TON
CACTUS FERRUGINOUS PYGMY OWL	<i>Glaucidium brasilianum cactorum</i>	COR
BALD EAGLE	<i>Haliaeetus leucocephalus</i>	ALL
WHITE-EARED HUMMINGBIRD	<i>Hylocharis leucotis</i>	GIL, COR
YELLOW-EYED JUNCO	<i>Junco phaeonotus</i>	COR (Douglas RD in NM), TON
WHITE-TAILED PTARMIGAN	<i>Lagopus leucura</i>	CAR, SFE
WHISKERED SCREECH OWL	<i>Megascops trichopsis</i>	COR
GILA WOODPECKER	<i>Melanerpes uropygialis</i>	GIL
GOULD'S WILD TURKEY	<i>Meleagris gallopavo mexicana</i>	COR
ABERT'S TOWHEE	<i>Melospiza aberti</i>	COR, GIL
SULPHUR-BELLIED FLYCATCHER	<i>Myiodynastes luteiventris</i>	COR, TON
ROSE-THROATED BECARD	<i>Pachyramphus aglaiae</i>	COR
VARIED BUNTING	<i>Passerina versicolor</i>	COR, LIN
ARIZONA WOODPECKER	<i>Picoides arizonae</i>	COR

ELEGANT TROGON	<i>Trogon elegans</i>	COR
LESSER PRAIRIE-CHICKEN ¹	<i>Tympanuchus pallidicinctus</i>	CIB (KRB and BK)
THICK-BILLED KINGBIRD	<i>Tyrannus crassirostris</i>	COR
ARIZONA BELL'S VIREO	<i>Vireo bellii arizonae</i>	GIL, LIN
GRAY VIREO	<i>Vireo vicinior</i>	CAR, COR (Douglas RD), SFE, CIB, GIL, LIN
CLAMS (3)		
CALIFORNIA FLOATER	<i>Anodonta californiensis</i>	A-S, COC
LILLJEBORG PEACLAM	<i>Pisidium lilljeborgi</i>	SFE
SANGRE DE CRISTO PEA-CLAM	<i>Pisidium sanguinichristi</i>	CAR
CRUSTACEANS (2)		
KAIBAB FAIRY SHRIMP	<i>Branchinecta kaibabensis</i>	KAI
DUMONT'S FAIRY SHRIMP	<i>Streptocephalus henridumontis</i>	CIB, LIN
FISH (13)		
MEXICAN STONEROLLER	<i>Campostoma ornatum</i>	COR
DESERT SUCKER	<i>Catostomus clarkii</i>	A-S, COC, COR, GIL, PRE, TON
ZUNI BLUEHEAD SUCKER ¹	<i>Catostomus discobolus jarrovii</i>	CIB
SONORA SUCKER	<i>Catostomus insignis</i>	A-S, COC, COR, GIL, TON, PRE
RIO GRANDE SUCKER	<i>Catostomus plebeius</i>	CIB, CAR, GIL, SFE
LITTLE COLORADO SUCKER	<i>Catostomus sp.3</i>	COC, A-S (indirect effects as likely not on Forest Service lands {A-S only}).
GREENTHROAT DARTER	<i>Etheostoma lepidum</i>	LIN could have indirect effects. Likely not on Forest.
HEADWATER CHUB	<i>Gila nigra</i>	COC, GIL, TON
RIO GRANDE CHUB	<i>Gila pandora</i>	CAR, CIB, LIN, SFE
ROUNDTAIL CHUB	<i>Gila robusta</i>	A-S, COC, CAR, GIL, TON, PRE
HEADWATER CATFISH	<i>Ictalurus lupus</i>	LIN
RIO GRANDE CUTTHROAT TROUT	<i>Oncorhynchus clarki virginalis</i>	CAR, GIL, LIN, SFE
SUCKERMOUTH MINNOW	<i>Phenacobius mirabilis</i>	CIB (KRB)
INSECTS (25)		
SUNRISE SKIPPER	<i>Adopaeoides prittwitzii</i>	COR
NETWING MIDGE	<i>Agathon arizonicus</i>	TON
HUACHUCA GIANT SKIPPER	<i>Agathymus evansi</i>	COR
SABINO CANYON DAMSELFLY	<i>Argia sabino</i>	COR
CESTUS SKIPPER	<i>Atrytonopsis cestus</i>	COR
A STONEFLY	<i>Capnia caryi</i>	A-S, GIL
PARKER'S CYLLOEPUS RIFFLE BEETLE	<i>Cylloepus parkeri</i>	TON
CHIRICAHUA WATER SCAVENGER BEETLE	<i>Cymbiodyta arizonica</i>	COR
DASHED RINGTAIL	<i>Erpetogomphus heterodon</i>	GIL
MOTH (Notodontid moth)	<i>Euhyparpax rosea</i>	GIL
PINALENO MONKEY GRASSHOPPER	<i>Eumorsea pinaleno</i>	COR
SACRAMENTO MOUNTAINS CHECKERSPOT BUTTERFLY	<i>Euphydryas anicia cloudcrofti</i>	LIN
A MAYFLY	<i>Fallceon eatoni</i>	TON
STEPHAN'S HETERELMIS RIFFLE BEETLE	<i>Heterelmis stephani</i>	COR
"GILA" MAY FLY	<i>Lachlania dencyanna</i>	GIL
A CADDISFLY	<i>Lepidostoma apache</i>	A-S
A CADDISFLY	<i>Lepidostoma knulli</i>	A-S, COC
A CADDISFLY	<i>Limnephilus granti</i>	A-S, COR

FERRIS' COPPER	<i>Lycaena ferrisi</i>	A-S
A MAYFLY	<i>Moribaetis mimbresaurus</i>	COC
BALMORHEA SADDLE-CASE CADDISFLY	<i>Protophila balmorhea</i>	COC
A CADDISFLY	<i>Psychoronia brooksi</i>	LIN; Ruidoso RD
NOKOMIS FRITILLARY	<i>Speyeria nokomis nokomis</i>	CAR
BONITA DIVING BEETLE	<i>Stictotarusus neomexicana (aka. Deroneotes n.)</i>	LIN
A Cave Obligate Pseudoscorpion	<i>Tuberochernes ubicki</i>	COR
A CADDISFLY	<i>Wormaldia planae</i>	COC, PRE, TON
MAMMALS (37)		
NORTHERN PYGMY MOUSE	<i>Baiomys taylori ater</i>	COR
MEXICAN LONG-TONGUED BAT	<i>Choeronycteris mexicana</i>	COR
PALE TOWNSEND'S BIG-EARED BAT	<i>Corynorhinus townsendii pallascens</i>	A-S, CAR, CIB, COC, COR, GIL, KAI, LIN, PRE, SFE, TON
GUNNISON'S PRAIRIE DOG (prairie population)	<i>Cynomys gunnisoni</i>	CAR, CIB, SFE, GIL
GUNNISON'S PRAIRIE DOG (montane population)	<i>Cynomys gunnisoni pop. 1</i>	CAR, CIB, SFE, GIL
BLACK-TAILED PRAIRIE DOG	<i>Cynomys ludovicianus</i>	CIB (KRB only)
HOUSEROCK VALLEY CHISEL TOOTHED KANGAROO RAT (aka: Marble Canyon Kangaroo Rat)	<i>Dipodomys microps leucotis</i>	KAI
SPOTTED BAT	<i>Euderma maculatum</i>	A-S, CAR, CIB, COC, GIL, KAI, LIN, SFE, TON
WHITE MOUNTAINS GROUND SQUIRREL	<i>Ictidomys tridecemlineatus monticola</i>	A-S
ALLEN'S LAPPET-BROWED BAT	<i>Idionycteris phyllotis</i>	A-S, CIB, COC, COR, GIL, KAI, TON
WESTERN RED BAT	<i>Lasiurus blossevillii</i>	A-S, COC, COR, GIL, KAI, LIN, PRE, TON
WESTERN YELLOW BAT	<i>Lasiurus xanthinus</i>	COR
CANADA LYNX	<i>Lynx canadensis</i>	CAR, SF (species not known to occur historically. CO reintroduction in 1999 has resulted in lynx traveling through northern NM)
AMERICAN MARTEN	<i>Martes americana origenes</i>	CAR, SFE
HOODED SKUNK	<i>Mephitis macroura milleri</i>	COR*, GIL
WHITE-BELLIED LONG-TAILED VOLE	<i>Microtus longicaudus leucophaeus</i>	COR
NAVAJO MOGOLLON VOLE	<i>Microtus mogollonensis navaho</i>	A-S, COC, KAI
ARIZONA MONTANE VOLE	<i>Microtus montanus arizonensis</i>	A-S, GIL
WHITE MOUNTAINS CHIPMUNK	<i>Neotamias minimus arizonensis</i>	A-S
PENASCO LEAST CHIPMUNK	<i>Neotamias minimus atristriatus</i>	LIN
GOAT PEAK PIKA	<i>Ochotona princeps nigrescens</i>	SFE
AMERICAN PIKA	<i>Ochotona princeps saxatilis</i>	CAR, SFE
SPRINGERVILLE SILKY POCKET MOUSE	<i>Perognathus flavus goodpasteri</i>	A-S
MESQUITE (Merriam's) MOUSE	<i>Peromyscus merriami</i>	COR
ARIZONA GRAY SQUIRREL	<i>Sciurus arizonensis arizonensis</i>	GIL
CHIRICAHUA SQUIRREL	<i>Sciurus nayaritensis chiricahuae</i>	COR
ARIZONA SHREW	<i>Sorex arizonae</i>	COR
CINEREUS (MASKED) SHREW	<i>Sorex cinereus</i>	CAR, SFE
NEW MEXICO SHREW	<i>Sorex neomexicanus</i>	LIN
AMERICAN WATER SHREW	<i>Sorex palustris</i>	A-S, CAR, SFE
PREBLE'S SHREW	<i>Sorex preblei</i>	SFE

GUADALUPE POCKET GOPHER	<i>Thomomys bottae guadalupensis</i>	LIN
CEBOLLETA SOUTHERN POCKET GOPHER	<i>Thomomys bottae paguatae</i>	CIB
SWIFT FOX	<i>Vulpes velox</i>	CIB NGs
NEW MEXICO MEADOW JUMPING MOUSE ¹	<i>Zapus hudsonius luteus</i>	A-S, CAR, LIN, SFE

REPTILES (19)

GIANT SPOTTED WHIPTAIL	<i>Aspidoscelis stictogramma</i>	COR
RED-BACKED WHIPTAIL	<i>Aspidoscelis xanthonota</i>	COR
MOTTLED ROCK RATTLESNAKE	<i>Crotalus lepidus lepidus</i>	LIN
TWIN-SPOTTED RATTLESNAKE	<i>Crotalus pricei</i>	COR
ARIZONA RIDGENOSE RATTLESNAKE	<i>Crotalus willardi willardi</i>	COR
SONORAN DESERT TORTOISE	<i>Gopherus morafkai</i>	COR, PRE, TON
THORNSCRUB HOOK-NOSED SNAKE	<i>Gyalopion quadrangulare</i>	COR
BROWN VINESNAKE	<i>Oxybelis aeneus</i>	COR
MOUNTAIN SKINK	<i>Plestiodon callicephalus</i>	COR
SLEVIN'S BUNCHGRASS LIZARD	<i>Sceloporus slevini</i>	COR
GREEN RATSNAKE	<i>Senticolis triaspis</i>	COR
CHIHUAHAUN BLACK-HEADED SNAKE	<i>Tantilla wilcoxi</i>	COR
YAQUI BLACK-HEADED SNAKE	<i>Tantilla yaquia</i>	COR
NORTHERN MEXICAN GARTERSNAKE ¹	<i>Thamnophis eques megalops</i>	A-S, COC, COR, TON, PRE, GIL
ARID LAND RIBBONSNAKE (aka Western ribbonsnake)	<i>Thamnophis proximus diabolicus</i>	CIB (KRB), LIN
NARROW-HEADED GARTERSNAKE ¹	<i>Thamnophis rufipunctatus</i>	A-S, COC, GIL, PRE, TON
BEZY'S NIGHT LIZARD	<i>Xantusia bezyi</i>	COR, TON

SNAILS (37)

SILVER CREEK WOODLANDSNAIL	<i>Ashmunella binneyi</i>	GIL
NO COMMON NAME	<i>Ashmunella cockerelli argenticola</i>	GIL
BLACK RANGE WOODLANDSNAIL	<i>Ashmunella cockerelli cockerelli</i>	GIL
NO COMMON NAME	<i>Ashmunella cockerelli perobtusa</i>	GIL
WHITewater CREEK WOODLANDSNAIL	<i>Ashmunella danieli</i>	GIL
IRON CREEK WOODLANDSNAIL	<i>Ashmunella mendax</i>	GIL
CAPITAN WOODLANDSNAIL	<i>Ashmunella pseudodonta</i>	LIN
NO COMMON NAME	<i>Ashmunella tetrodon animorum</i>	GIL
NO COMMON NAME	<i>Ashmunella tetrodon inermis</i>	GIL
NO COMMON NAME	<i>Ashmunella tetrodon mutator</i>	GIL
DRY CREEK WOODLANDSNAIL	<i>Ashmunella tetrodon tetrodon</i>	GIL
RIO GRANDE SNAGGLETOOTH	<i>Gastrocopta riograndensis</i>	LIN
RUIDOSO SNAGGLETOOTH	<i>Gastrocopta ruidosensis</i>	LIN, SNF
VAGABOND HOLOSPIRA	<i>Holospira montivaga</i>	LIN
NORTHERN THREEBAND (Snail)	<i>Humboldtiana ultima</i>	LIN
BEARDED MOUNTAINSNAIL	<i>Oreohelix barbata</i>	GIL, COR
PINALENO MOUNTAINSNAIL	<i>Oreohelix grahamensis</i>	COR
MAGDALENA MOUNTAINSNAIL	<i>Oreohelix magdalenae</i>	CIB
NO COMMON NAME	<i>Oreohelix metcalfei acutidiscus</i>	GIL
NO COMMON NAME (Black Range mountainsnail)	<i>Oreohelix metcalfei concentrica</i>	GIL
NO COMMON NAME	<i>Oreohelix metcalfei metcalfei</i>	GIL
NO COMMON NAME	<i>Oreohelix metcalfei radiata</i>	GIL
NO COMMON NAME	<i>Oreohelix nogalensis (aka O. strigosa nogalensis)</i>	LIN
MINERAL CREEK MOUNTAINSNAIL	<i>Oreohelix pilsbryi</i>	GIL
MORGAN CREEK MOUNTAINSNAIL	<i>Oreohelix swopei</i>	GIL
GILA SPRINGSNAIL	<i>Pyrgulopsis gilae</i>	GIL
VERDE RIM SPRINGSNAIL	<i>Pyrgulopsis glandulosa</i>	PRE

PAGE SPRINGSNAIL	<i>Pyrgulopsis morrisoni</i>	COC
FOSSIL SPRINGSNAIL	<i>Pyrgulopsis simplex</i>	COC, TON
BROWN SPRINGSNAIL	<i>Pyrgulopsis sola</i>	PRE
NEW MEXICO SPRINGSNAIL	<i>Pyrgulopsis thermalis</i>	GIL
HUACHUCA SPRINGSNAIL	<i>Pyrgulopsis thompsoni</i>	COR
CLARK PEAK TALUSSNAIL	<i>Sonorella christenseni</i>	COR
PINALENO TALUSSNAIL	<i>Sonorella grahamensis</i>	COR
NO COMMON NAME GIVEN; see Metcalf and Smartt (1997)	<i>Sonorella hachitana peloncillensis</i>	COR
MIMIC TALUSSNAIL	<i>Sonorella imitator</i>	COR
WET CANYON TALUSSNAIL	<i>Sonorella macrophallus</i>	COR
SONORAN TALLUSNAIL	<i>Sonorella magdalenensis</i>	COR

DEFINITIONS	
1	Species is proposed for federal listing, and will be removed from the RFSS list if/once the final rule is published implementing the Federal protections provided by the ESA.
A-S	Apache-Sitgreaves National Forests
CAR	Carson National Forest
CIB	Cibola National Forest
COC	Coconino National Forest
COR	Coronado National Forest
GIL	Gila National Forest
KAI	Kaibab National Forest
KRB	Kiowa/Rita Blanca National Grasslands
LIN	Lincoln National Forest
PRE	Prescott National Forest
SFE	Santa Fe National Forest

APPENDIX D

**AGFD HERITAGE
DATABASE
MANAGEMENT
SYSTEM ON-LINE
REVIEW**

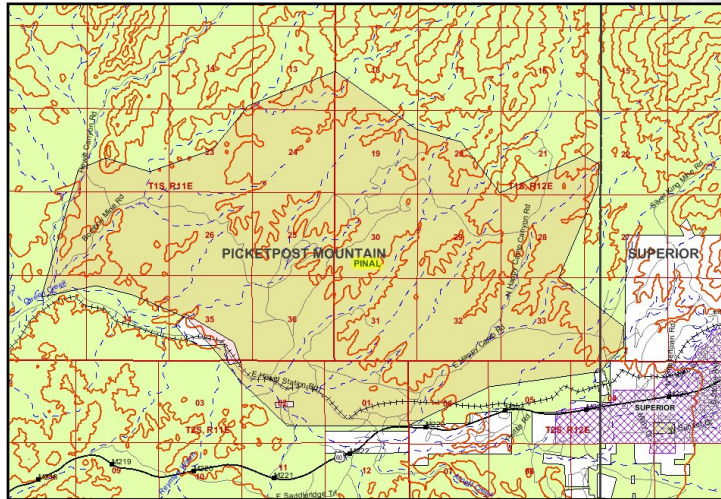
Arizona's On-line Environmental Review Tool

Search ID: 20140127022313

Project Name: Near West

Date: 1/27/2014 8:59:57 AM

Project Location



Project Name: Near West

Submitted By: Carolyn Chilcote

On behalf of: CONSULTING

Project Search ID: 20140127022313

Date: 1/27/2014 8:59:52 AM

Project Category: Mining, Exploration

Project Coordinates (UTM Zone 12-NAD 83): 483453.810, 3685691.051 meter

Project Area: 11498.882 acres

Project Perimeter: 31377.883 meter

County: PINAL

USGS 7.5 Minute Quadrangle ID: 1359

Quadrangle Name: PICKETPOST MOUNTAIN

Project locality is currently being scoped

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
<i>Abutilon parishii</i>	Pima Indian Mallow	SC	S	S	SR
<i>Aquila chrysaetos</i>	Golden Eagle	BGA		S	
Bat Colony					
<i>Buteogallus anthracinus</i>	Common Black-Hawk				WSC
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo (Western U.S. DPS)	PT	S		WSC
<i>Cyprinodon macularius</i>	Desert Pupfish	LE			WSC
<i>Empidonax traillii extimus</i>	Southwestern Willow Flycatcher	LE			WSC
<i>Eumops perotis californicus</i>	Greater Western Bonneted Bat	SC		S	
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC	S	S	WSC
<i>Gopherus morafkai</i>	Sonoran Desert Tortoise	C*	S		WSC
<i>Lasiurus blossevillii</i>	Western Red Bat		S		WSC
<i>Lithobates yavapaiensis</i>	Lowland Leopard Frog	SC	S	S	WSC
<i>Mabrya acerifolia</i>	Mapleleaf False Snapdragon		S		
<i>Myotis yumanensis</i>	Yuma Myotis	SC			
<i>Poeciliopsis occidentalis occidentalis</i>	Gila Topminnow	LE			WSC

Location 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 Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

Arizona's On-line Environmental Review Tool

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Project Name: Near West

Date: 1/27/2014 8:59:57 AM

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These 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). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: <http://arizonaes.fws.gov/>.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. 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.
2. The Department's 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.
3. 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. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Mining, Exploration

Project Type Recommendations:

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

Based on the project type entered; coordination with State Historic Preservation Office may be required <http://azstateparks.com/SHPO/index.html>

Complete reclamation of the disturbed area(s) should occur after all project activities have ceased. The Department recommends that all land contours and topography be restored to their original condition (where applicable). Local soils and native vegetation should be used for all reclamation activities. Consider the local wildlife and design reclamation efforts to meet their habitat needs. Avoid reclamation/restoration designs that would prohibit wildlife from moving through the reclamation site to adjacent habitats.

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be

taken to wash all equipment utilized in the project activities before and after project activities to reduce the spread of invasive species. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants <http://www.azda.gov/PSD/quarantine5.htm>. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: <http://www.usda.gov/wps/portal/usdahome>. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml.

For mine closures, 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 Bat Coordinator in Nongame Branch: http://www.azgfd.gov/inside_azgfd/agency_directory.shtml

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 (including 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

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Project Name: Near West

Date: 1/27/2014 8:59:57 AM

activities outside of breeding seasons.

Project Location and/or Species recommendations:

Heritage Data Management System records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:

Ecological Services Office
US Fish and Wildlife Service
2321 W. Royal Palm Rd.
Phoenix, AZ 85021-4951
Phone: 602-242-0210
Fax: 602-242-2513

Heritage Data Management System records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area (refer to page 1 of the receipt). Please contact:

Arizona Department of Agriculture
1688 W Adams
Phoenix, AZ 85007
Phone: 602-542-4373

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected

agencies.

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. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.

6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt 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).**

7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail 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**

Terms of Use

By using this site, you acknowledge that you have read and understand the terms of use. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for

Arizona's On-line Environmental Review Tool

Search ID: 20140127022313

Project Name: Near West

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potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.

2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .

3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.

4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.

5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature: _____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization: _____

Contact Name: _____

Address: _____

Arizona's On-line Environmental Review Tool

Search ID: 20140127022313

Project Name: Near West

Date: 1/27/2014 8:59:57 AM

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization: _____

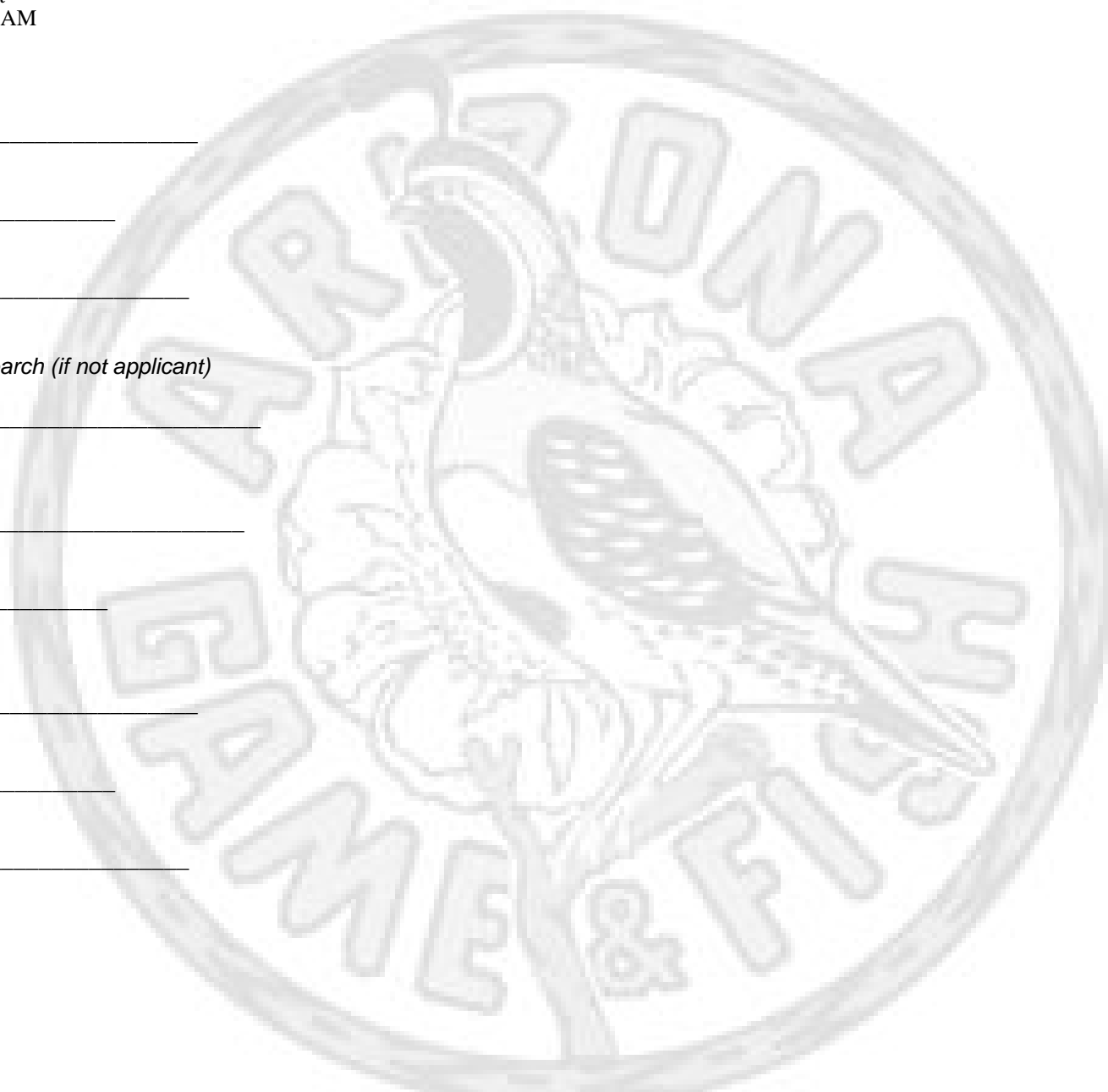
Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____



APPENDIX E

**GUIDELINES FOR
HANDLING
SONORAN DESERT
TORTOISES
ENCOUNTERED ON
DEVELOPMENT
PROJECTS**

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES
ENCOUNTERED ON DEVELOPMENT PROJECTS
Arizona Game and Fish Department
Revised October 23, 2007

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

The Sonoran population of desert tortoises occurs south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 40° Celsius (105° Fahrenheit) unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to one-half mile, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 40° Celsius (105° Fahrenheit), the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- . These guidelines do not apply to the Mojave population of desert tortoises (north and west of the Colorado River). Mojave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.
- . These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.
- . Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.