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20 East Thomas Road, Suite 1700
Phoenix, Arizona 85012
Tel 602.274.3831 Fax 602.274.3958
www.swca.com

TECHNICAL MEMORANDUM

To: Neil Bosworth, Forest Supervisor
U.S. Department of Agriculture Forest Service, Tonto National Forest
2324 East McDowell Road
Phoenix, Arizona 85006

From: Eleanor Gladding, Senior Biologist

Date: April 15, 2025

Re: **Resolution Copper Project Section 7 Reinitiation Analysis (02EAAZ00-2020-F-0822) / SWCA Project No. 30951-008-PHX**

INTRODUCTION

SWCA Environmental Consultants (SWCA) has prepared this technical memorandum on behalf of the Tonto National Forest (TNF) for the Resolution Copper Project and Land Exchange (herein called the Resolution Copper Project or the project) in Gila and Pinal Counties, Arizona. SWCA is the designated non-federal agent for preparation of the biological assessment (BA) and for the Endangered Species Act (ESA) Section 7 consultation process by the TNF, in accordance with 50 Code of Federal Regulations 402.08. On June 24, 2020, the revised final BA for consultation was submitted to the U.S. Fish and Wildlife Service (USFWS) with a request to initiate Section 7 consultation. Subsequently, on December 31, 2020, the USFWS issued the final biological opinion (BO) for the project under Arizona Consultation Codes 02EAAZ00-2020-F-0822, 02EAAZ00-2020-SLI-0104, and 02EAAZ00-2020-SLI-0553. Since that time, the project has been delayed for various reasons; thus, this analysis was conducted to determine whether reinitiation of Section 7 consultation is now warranted due to the delay. The BO indicated that reinitiation of Section 7 should be considered if

> 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion or written concurrence; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. (USFWS 2020:55)

SWCA and TNF have completed reviews and analysis to determine whether reinitiation of Section 7 consultation under the ESA is warranted, and this technical memorandum outlines the various changes that could potentially warrant reinitiation of Section 7 consultation with the USFWS.

ARIZONA HEDGEHOG CACTUS

The 2020 BA concluded that the proposed action may affect and is likely to adversely affect the Arizona hedgehog cactus (*Echinocereus arizonicus* ssp. *arizonicus*) (AHC), and the 2020 BO concurred with this

effect determination. Through discussions, the proponent agreed to place a 100-acre conservation easement on private land it owns (JI Ranch) that contains numerous AHC individuals. This conservation easement would help offset the impacts to the species from the project and could be set aside to protect those individual AHC for the life of the project or until the release of the reclamation bond from the TNF. Table 1 shows the number of known and estimated AHC individuals as published in the June 2020 BA (SWCA 2020a) and in the October 2020 BA Addendum (SWCA 2020b).

Table 1. Number of Known AHC Individuals and Estimated AHC Individuals in 2020

Known and Estimated AHC Individuals	Project Area	Action Area
Number of known AHC (June 2020 BA)	165	2,087
Number of estimated AHC (June 2020 BA)	83	5,176
Total AHC (per June 2020 BA)	**248**	**7,263**
Number of known AHC (October 2020 BA Addendum)	165	1,962
Number of estimated AHC (October 2020 BA Addendum)	81	5,310
Total AHC (per October 2020 BA Addendum)	**246**	**7,272**

Sources: June 2020 BA (SWCA 2020a); October 2020 BA Addendum (SWCA 2020b)

In May 2021, the range of the AHC was updated using vetted known occurrences and environmental covariates (USFWS 2021a). The AHC range was expanded to approximately 141,248 acres (USFWS 2021b) (Figure 1). The expansion of the range increased the amount of project area acreage and action area acreage within the range. However, the expansion of the range decreased the proportion of the range that intersects the project area and action area (Table 2).

Table 2. Acres of Project Area and Action Area within Previous AHC Range and 2021 AHC Range

Area Intersecting with Fire Boundary	Acres Intersecting Previous AHC Range	Acres Intersecting 2021 AHC Range	Proportion of Area within Previous Range	Proportion of Area within 2021 AHC Range
Known AHC range	39,795.2	148,273	–	–
Project area	922.5	1,667.2	2.3%	1.1%
Action area	10,070.7	25,964.2	25.3%	17.5%

In July 2023, the USFWS published the "Arizona Hedgehog Cactus (*Echinocereus arizonicus* ssp. *arizonicus*) 5-Year Status Review: Summary and Evaluation" (USFWS 2023a). This document provides a review of current species information as well as a discussion of the known population size. In 2021 and 2022, USFWS and the Arizona Game and Fish Department reviewed the known AHC records and estimated that there were approximately 5,998 AHC individuals in 2020.

Since the publication of the BO for this project in December 2020, two wildfires have affected portions of the Resolution Copper Project or overall AHC range: the Telegraph Fire and the Carlota Fire. The Telegraph Fire started near Superior, Arizona, on June 4, 2021, and was contained at 180,757 acres on July 3, 2021. The Carlota Fire started near Top-of-the-World, Arizona, on July 26, 2023, and burned approximately 344 acres. The Telegraph Fire footprint intersects the project area, the action area, the JI Ranch property (AHC mitigation parcel), and the overall AHC range (Figures 2 and 3, Table 3). The Carlota Fire footprint does not intersect the project area, the action area, or the JI Ranch property; however, it intersects an area within the overall AHC range with many known individuals.

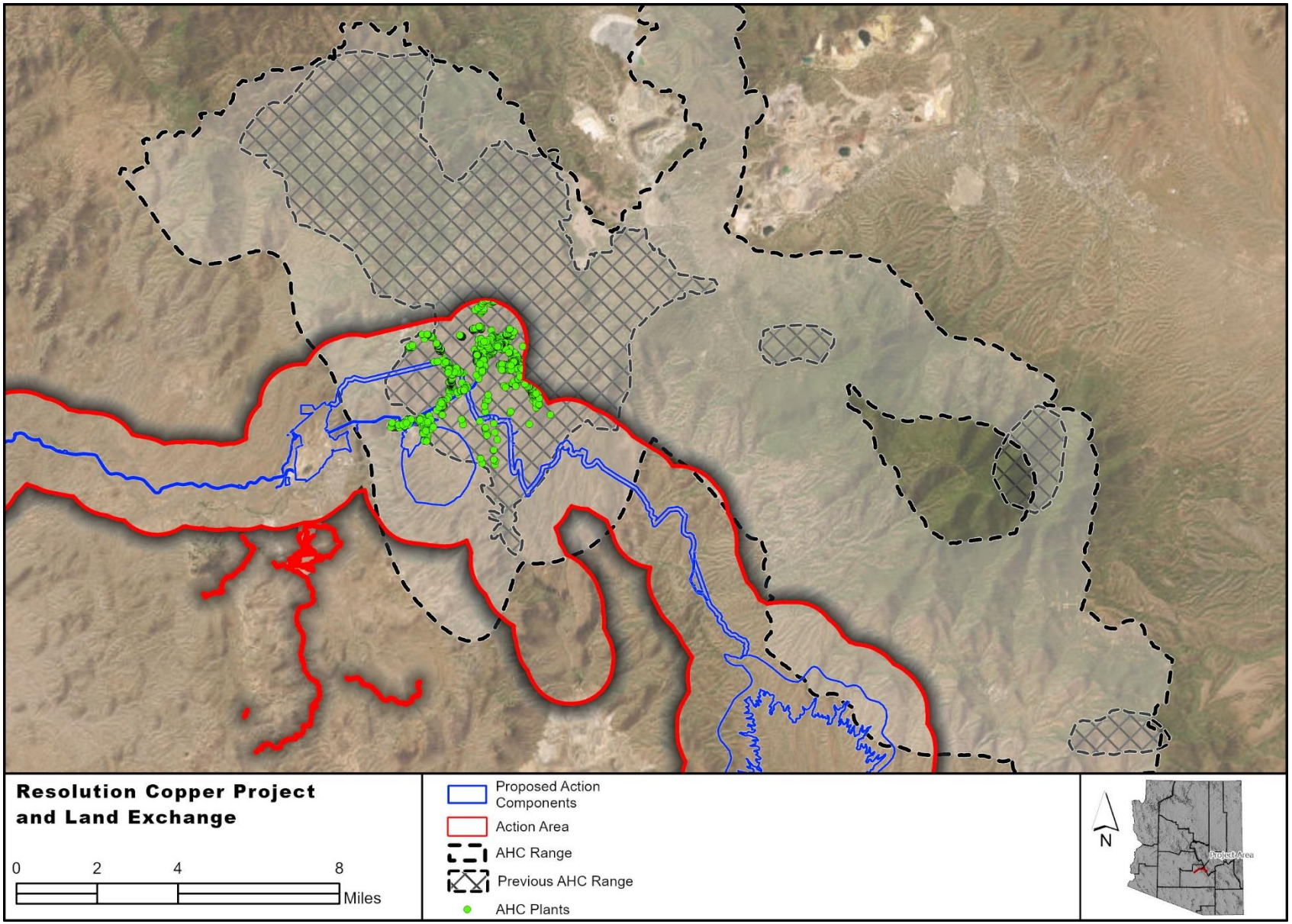

Figure 1. Current and previous AHC range with project area and action area.

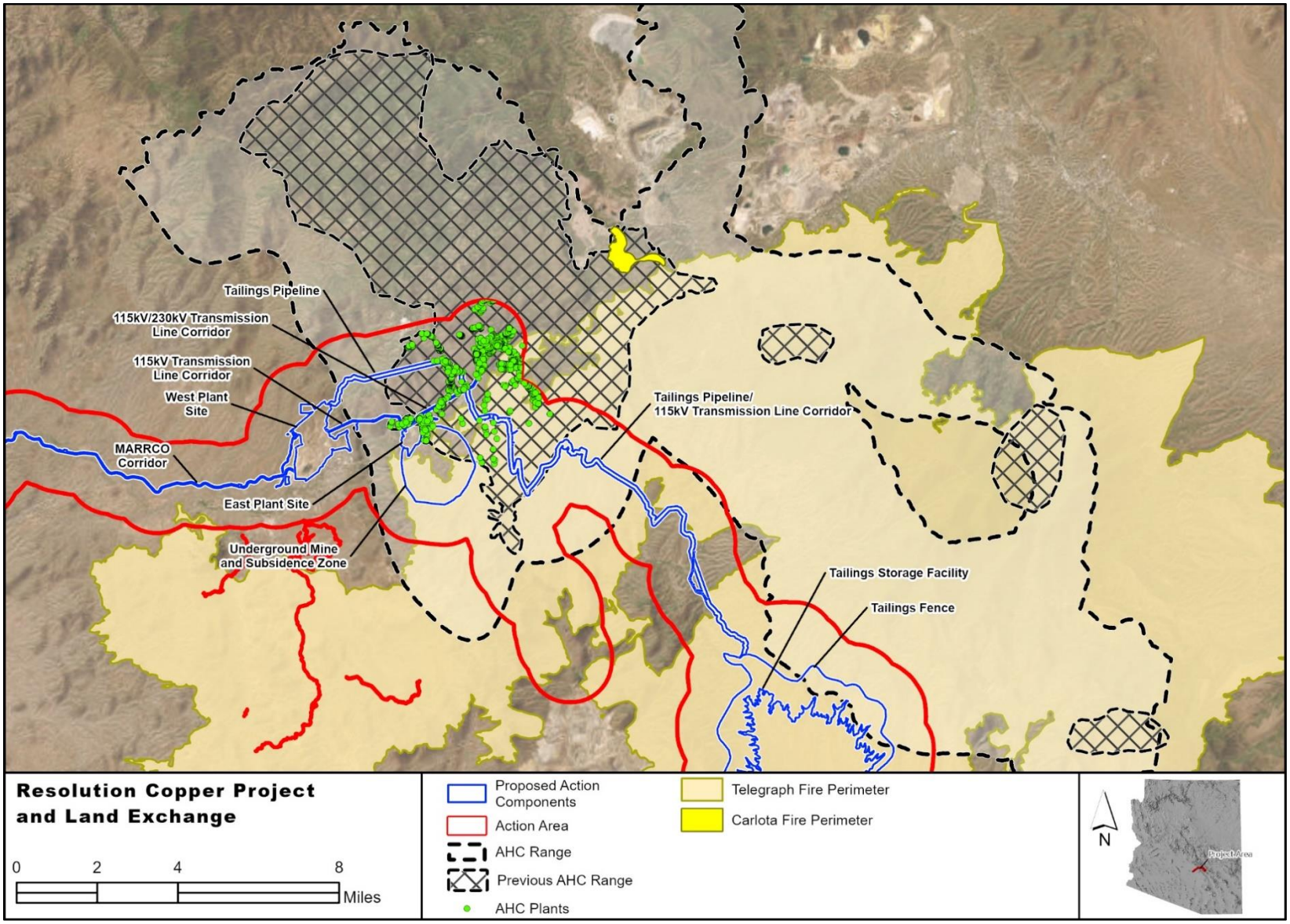

Figure 2. AHC individuals and AHC range with project area and action area plus the Telegraph Fire and Carlota Fire impact areas. (Note: kV = kilovolt.)

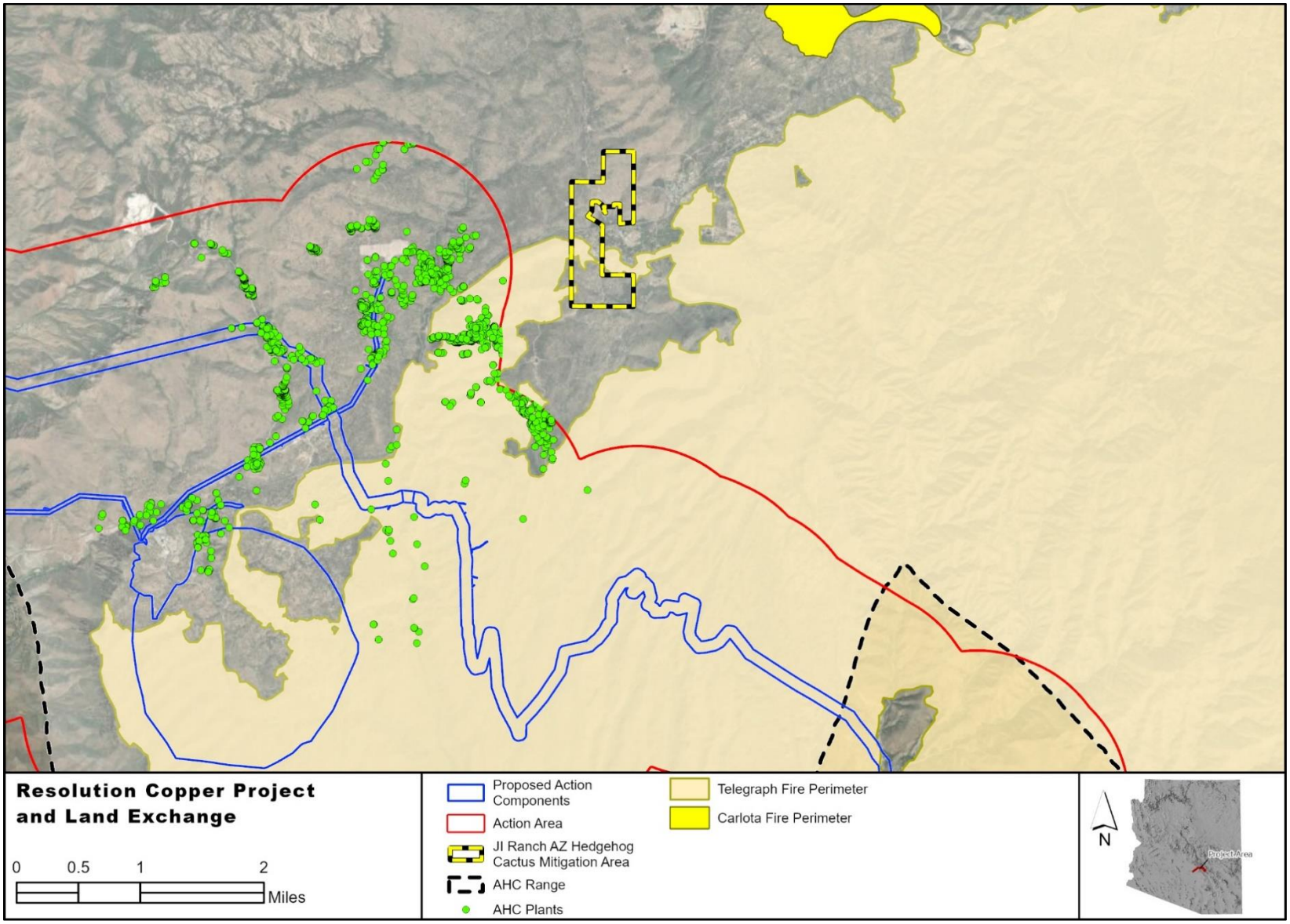

Figure 3. AHC individuals and AHC range with project area, action area, and JI Ranch plus the Telegraph Fire and Carlota Fire impact areas.

Table 3. Acres in AHC Range and in the Project Area Impacted by the Telegraph and Carlota Fires

Area Intersecting Fire Boundary	Acres Intersecting Previous AHC Range as Reported in the BA	Acres Intersecting 2021 AHC Range from Recent GIS Calculations*	Acres in Telegraph Fire Boundary†	Acres in Carlota Fire Boundary†
Known AHC range	39,795.2	148,273	79,826.3	344
Project area	922.5	1,667.2	405.4	0
Action area	10,070.7	25,964.2	4,492.2	0
JI Ranch (entire)	274.2	274.2	55.22	0
JI Ranch North Conservation Easement	Not applicable‡	70.49	0	0
JI Ranch South Conservation Easement	Not applicable‡	55.22	30.4	0

Note: GIS = geographic information system

* The change in acreages from the BA to this technical memorandum is due to 1) the changes in the preferred alternative boundaries after preparation of the June 2020 BA (SWCA 2020a) and 2) the updated known AHC range from USFWS (2021b).

† Telegraph Fire and Carlota Fire boundaries provided by the U.S. Forest Service.

‡ The North and South Conservation Easement areas were not defined in the June 2020 BA (SWCA 2020a).

The project area is the footprint of the proposed action components and mitigation lands, and the action area is the project area plus a buffer to account for indirect impacts associated with light, noise, and dust from the project. JI Ranch is where Resolution Copper will record a conservation easement on at least 100 acres with suitable AHC habitat (WestLand Resources Inc. [WestLand] 2020a), referred to as the North and South Conservation Easement areas (Figure 4). Because the Telegraph Fire intersects the project area and the Carlota Fire intersects an area with many known individuals, an analysis of the wildfire effects on the AHC has been conducted.

The TNF documented 1,578 AHC individuals within the Telegraph Fire boundary before the fire (U.S. Forest Service [Forest Service] 2022). The TNF conducted post-fire AHC survivorship monitoring in fall 2021 and April 2022 at four monitoring locations within the Telegraph Fire boundary. Initial monitoring in fall 2021 assessed the health of 223 AHC individuals, and follow-up monitoring in April 2022 assessed 125 AHC individuals. The initial monitoring effort in fall 2021 found 74% of monitored individuals alive post-fire, with individuals in areas of higher burn severity generally having a higher mortality rate. Follow-up monitoring found more of both healthy individuals and dead individuals and found fewer individuals in the "fair" or "stressed" categories. The report notes that, "overall, to date it appears that more cacti are trending toward Healthy than Dead. Monitoring in future years will help show if this trend is only beginning or if it is an anomaly" (Forest Service 2022:10). Subsequent post-fire monitoring was conducted in 2023 and 2024. The most recent survey in 2024 found that out of 129 individuals located, 43 were dead (33%), 49 were healthy (38%), 14 were fair (11%), and 23 were stressed (18%) (Forest Service 2024). The USFWS 5-year review concluded that, after the Telegraph Fire, there are now fewer than 5,998 individuals, but it did not provide a revised population estimate, as full-coverage surveys of the burned areas have not been completed (USFWS 2023a).

The TNF had documented 342 AHC individuals within the Carlota Fire boundary before the fire (Forest Service 2023a). The Emergency BA determined that at least three AHC plants were negatively impacted by fire-suppression activities. The TNF, along with the USFWS, conducted post-fire survivorship monitoring of 224 AHC individuals in September 2023 (Forest Service 2023b). Of the 217 individuals found, 108 (49.8%) were dead, and 109 (50.2%) were alive. Of the 109 living individuals, 71 (65%) were in healthy or fair condition, while 38 (35%) were in stressed condition.

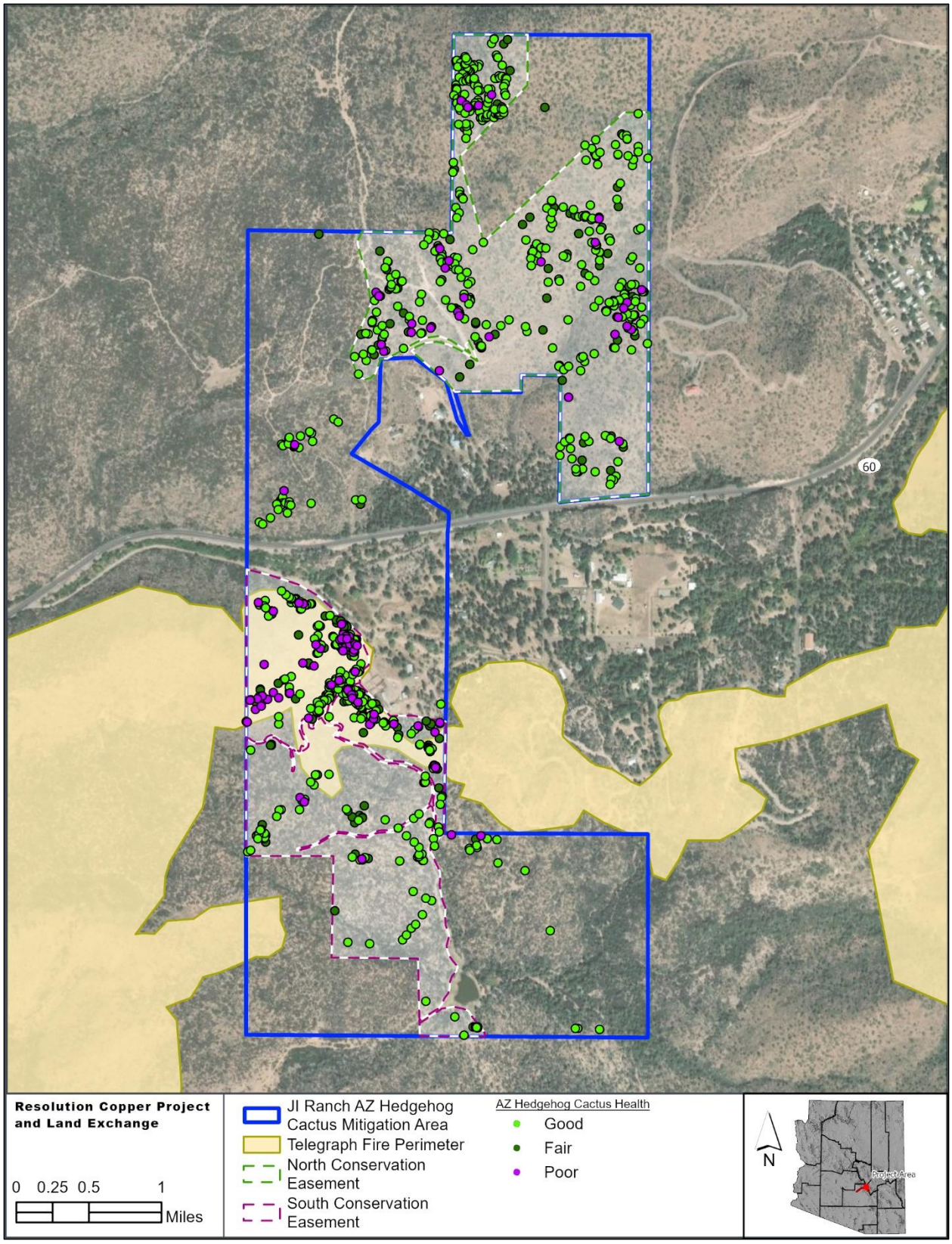

Figure 4. AHC individuals and their health status after the Telegraph Fire at JI Ranch.

In October 2021, WestLand conducted post–Telegraph Fire AHC surveys in the project area and action area and at JI Ranch (WestLand 2022) (Appendix A). WestLand verified that the TNF Telegraph Fire perimeter was accurate and that areas of the project area with known AHC were not affected. WestLand visited a subset of AHC within the action area and found that none of those individuals were impacted by the fire (see Figures 1 and 3 in Appendix A for maps showing AHC sampled during post-fire assessment).

In 2021, WestLand documented 1,062 living AHC cactus at JI Ranch (WestLand 2022) (Table 4). The North Conservation Easement contained 499 AHC cactus, and the South Conservation Easement contained 509 AHC cactus. The Telegraph Fire did not impact the North Conservation Easement and only burned a portion of the South Conservation Easement (see Figure 3 and Table 3). During post-fire surveys, the health status of all living cacti within the Telegraph Fire perimeter was assessed. Using the 2021 WestLand data and the final Telegraph Fire boundary, WestLand found 385 AHC alive within the Telegraph Fire boundary (WestLand 2022). WestLand did not document the number of dead cacti found within the Telegraph Fire boundary (WestLand 2022).

Table 4. Number of Known AHC Individuals within Project Components, AHC Range, and Fire Boundaries

Project Component	Total Known AHC Individuals	Total Known AHC Individuals within Telegraph Fire Boundary	Total Known AHC Individuals within Carlota Fire Boundary
Project area	242*	0	0
Action area	1,879†	695	0
JI Ranch (entire)‡	1,062	385	
JI Ranch North Conservation Easement‡	499	0	0
JI Ranch South Conservation Easement‡	509	385	0

* Since the BA, an additional 77 AHC individuals have been found within the project area (WestLand 2022).

† In the October 2020 BA addendum (SWCA 2020b), 1,962 AHC individuals were documented in the action area (see Table 1). Since the BA, the action area has decreased by 993 acres due to the changes in the preferred alternative boundaries after the preparation of the BA. This decrease in action area size likely accounts for the change in known AHC individuals within the action area.

‡ Source: WestLand (2022)

JI Ranch AHC Transplants

To augment the population of naturally occurring AHC individuals at JI Ranch, WestLand developed a propagation and transplant program on the property in 2011 (WestLand 2022). In 2016, 131 propagated AHC were transplanted to natural areas on JI Ranch, and in 2020, 280 AHC were transplanted, for a total of 411 transplanted individuals (WestLand 2022). The transplanted cacti are concentrated in an approximately 4.3-acre area within the South Conservation Easement area of JI Ranch (Figure 5). Monitoring conducted in November 2020 before the Telegraph Fire showed 31 (8%) in poor health, 175 (43%) in fair health, and 204 (50%) in good health.

Approximately 4.15 acres of the transplant area is within Telegraph Fire boundary (see Figure 5). Within the transplant area during the post-fire monitoring, WestLand documented 250 living AHC, 31 (12%) in poor health, 92 (37%) in fair health, and 127 (51%) in good health (WestLand 2022). The WestLand post-fire monitoring data do not distinguish between naturally occurring and transplanted AHC. The locations of the living AHC are shown in Figure 5. The 2021 post-fire monitoring data do not document dead cacti. However, knowing that 411 cacti had been transplanted into the AHC transplant area, 161 transplanted cacti can be presumed dead if WestLand revisited all living cacti in the area and all AHC in the transplant area are assumed to have been transplanted.

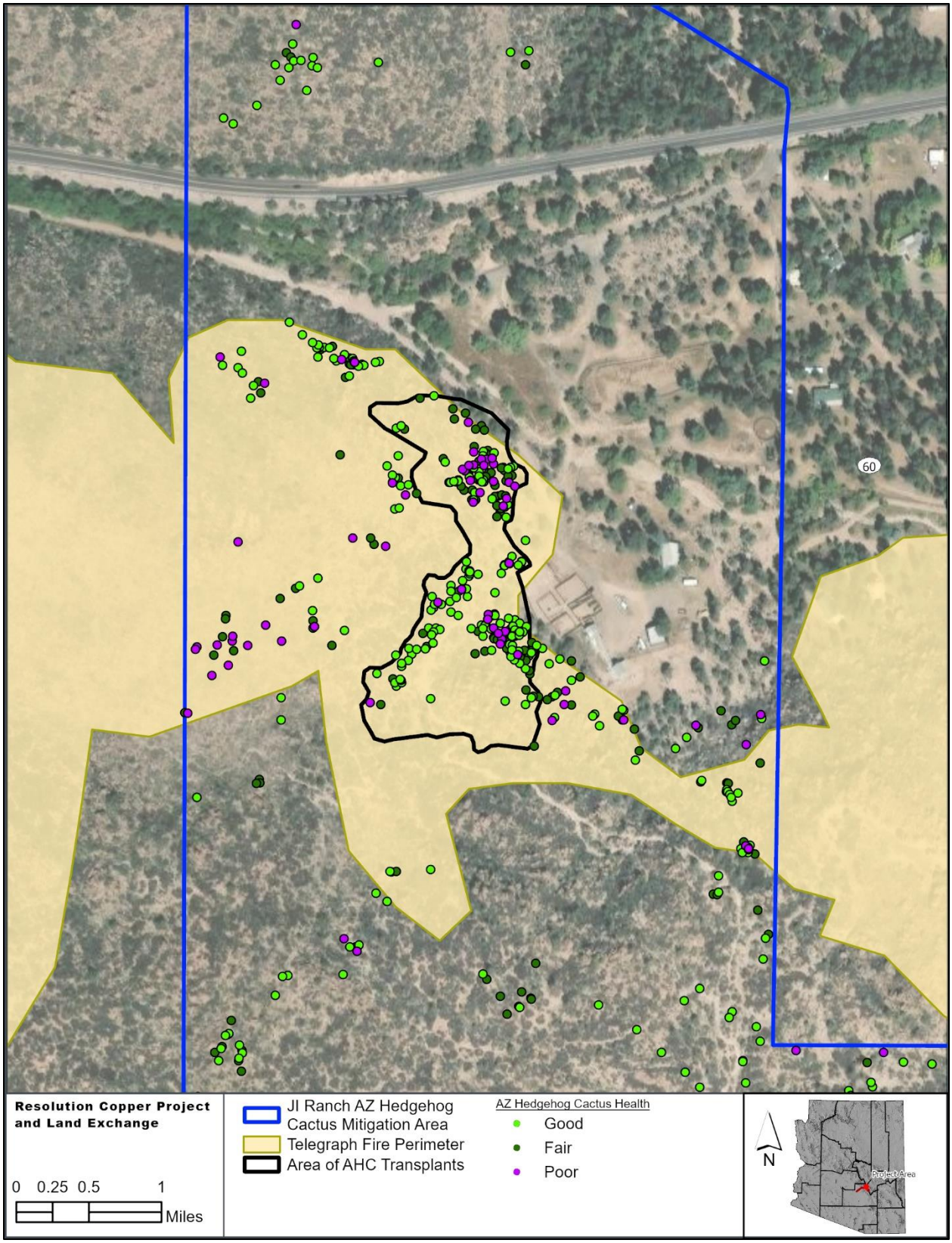

Figure 5. Area of transplanted AHC individuals at JI Ranch and their health status after the Telegraph Fire.

Summary of AHC Analysis

Project Area: Within the project area, the Telegraph Fire affected 1,667.2 acres of the known AHC range. Desktop review and post-fire surveys did not find any AHC individuals that had been impacted by the Telegraph Fire (WestLand 2022). The Telegraph Fire does not appear to have changed baseline conditions for the species in the project area because no known AHC individuals were impacted by the Telegraph Fire in the project area. Therefore, the conclusions of the BA and BO remain valid despite changes from the Telegraph Fire.

Action Area: Within the action area, the Telegraph Fire affected 25,964.2 acres of the known AHC range. Of the 1,879 known AHC individuals in the action area, 695 AHC individuals were within the Telegraph Fire boundary. WestLand conducted very limited post-fire surveys within the action area but did not find any individuals that had been impacted by the fire. Although the Telegraph Fire did change some baseline conditions for the species in the action area, they are not significant enough to change the conclusions of the BA or BO because the action area only accounts for indirect effects from the proposed action, i.e., dust and light. Those effects remain unchanged even with the Telegraph Fire effects.

JI Ranch: The Resolution South Conservation Easement within JI Ranch was within the Telegraph Fire boundary (see Figure 3); there were no fire-related impacts to the AHC within the North Conservation Easement, with 2021 surveys finding 499 living AHC (WestLand 2022). Within the South Conservation Easement, the Telegraph Fire affected 30.4 acres of the known AHC range. Post-fire surveys in the South Conservation Easement found 509 living AHC (WestLand 2022). Of the 509 living AHC, 161 are presumed to be transplanted individuals, as they occur within the AHC transplant area.

Although there were effects on AHC in the South Conservation Easement, the severity of effects did not render JI Ranch inadequate for mitigation as intended in the BA and BO, as there are still 1,008 living AHC present between the North Conservation Easement and the South Conservation Easement.

Known AHC Range: Approximately 79,826.3 acres of the 148,273 acres in the known AHC range (54%) was within the Telegraph Fire boundary. During post-fire monitoring of 223 individuals, TNF found 74% of individuals alive, though the mortality rate was influenced by fire severity. If a mortality rate of 26% is consistent across the 1,578 individuals that were known to occur in the fire boundary before the fire, 411 individuals could be expected to have died in the Telegraph Fire.

Approximately 344 acres of the 148,273 acres in known AHC range (<1%) was within the Carlota Fire boundary. During post-fire monitoring of 217 individuals, 49.8% were found dead. If a mortality rate of 49.8% is consistent across the 342 individuals that were known to occur in the fire boundary before the fire, 170 individuals could be expected to have died in the Carlota Fire.

Considering the most recent AHC population estimate of 5,998 individuals before the Telegraph Fire and the Carlota Fire, based on the mortality estimates described above, the estimated population is likely fewer than 5,417 individuals.

The following factors may have limited the impact of the Telegraph Fire on AHC: 1) AHC plants were present within fire-adapted vegetation communities; 2) AHC plants were present in microhabitats on open slopes and in areas with a relatively open canopy where fire intensity is generally lower; and/or 3) AHC plants were present in areas where fire intensity was low or absent. It is possible that the microhabitats preferred by AHC allow it to persist in vegetation communities with regular fires. It is also possible that AHC has some physical adaptation to fires, but this remains unknown from the current research on the species.

Although the Telegraph Fire and Carlota Fire had a significant impact on the known population of AHC and its habitat and the USFWS has published new information about the range for AHC and number of individuals, both of which meet reinitiation requirement #2 (i.e., new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion), the baseline conditions described in the BA and BO have not changed to the extent that the findings of the BA and BO would be invalidated. Further, although there were effects on AHC in South Conservation Easement within JI Ranch, which serves as mitigation for the effects on AHC from the project, the severity of the effect did not render these areas inadequate for mitigation as intended in the BO. Furthermore, the percentage of the AHC range affected by the project has been reduced (see Table 2), which decreases the effect on the species as a whole, i.e., the jeopardy analysis. Therefore, the conclusions of the BA and BO remain valid, and no additional consultation with the USFWS is warranted for AHC.

GILA CHUB AND CRITICAL HABITAT

The 2020 BA concluded that the proposed action may affect but is not likely to adversely affect Gila chub (*Gila intermedia*) and its designated critical habitat, and the 2020 BO concurred with this effect determination. Since that time, the USFWS has published a notification of petition finding and advance notice of proposed rulemaking in the *Federal Register* indicating that in reviewing information for the petition decision, it has determined that it should consider removing the species from ESA protections (USFWS 2022a). This is due to a recent taxonomic revision that concluded that species-level status is not warranted for Gila chub. At this time, these potential actions have not been completed; therefore, reinitiation of Section 7 consultation is not warranted for this species currently. The TNF should reevaluate this species if the listing status changes in the future.

Although the Telegraph Fire did burn within portions of and near Gila chub designated critical habitat along Mineral Creek within the action area (Figure 6), and some of the baseline conditions within the action area may have changed due to the Telegraph Fire, the conclusions of the 2020 BA and BO remain valid. This is because 1) Dripping Springs Road and its crossing of Mineral Creek is maintained by Gila County and if repairs were needed, then Gila County would need to address any impacts through its own analysis; 2) this proposed action analysis included a larger corridor for access using Dripping Springs Road and thus over-accounted for the likely level of impact; and 3) if the Telegraph Fire did affect the watershed through erosion and sedimentation, with associated changes to baseline conditions, the conclusions of the BA and BO regarding Gila chub and its designated critical habitat would not be altered because the proposed action includes best management practices to control erosion and sediment from construction. In summary, the Telegraph Fire alterations to baseline conditions have not changed the validity of the conclusions of the BA and BO.

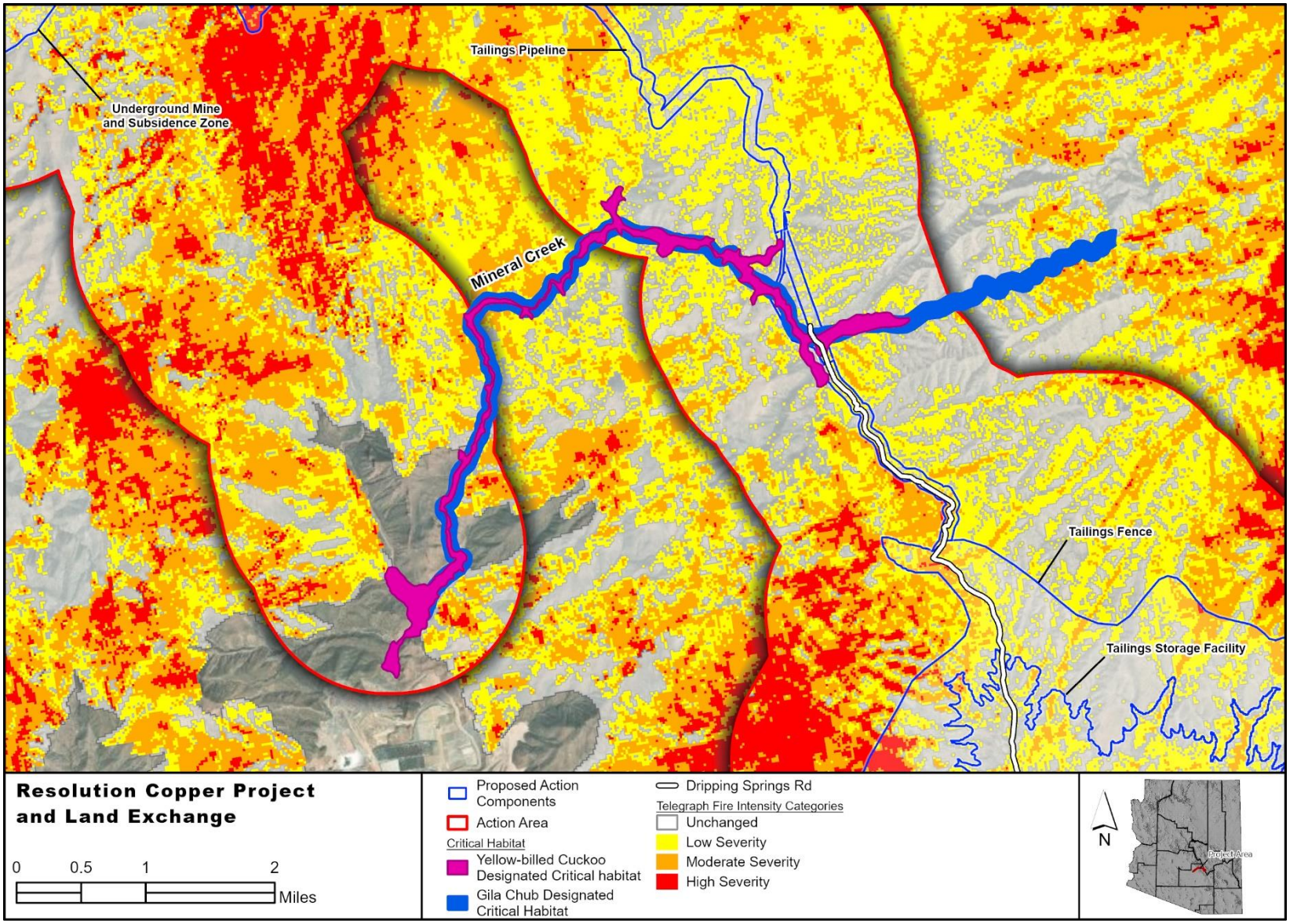

Figure 6. Telegraph Fire severity within the project and action areas depicting the locations of designated critical habitat for the Gila chub and yellow-billed cuckoo in and near Mineral Creek and Dripping Springs Road.

SPECIES LIST CHANGES

To check for any new species that may have been listed or delisted since the BO was completed, SWCA obtained an updated official species list through the Information for Planning and Consultation (IPaC) system on January 29, 2025 (USFWS 2025) (Appendix B). In reviewing the updated official IPaC list and the species and their listing status used to prepare the BA, SWCA determined that 1) new species had been added on the species list; 2) species that were addressed in the BA had status changes; and 3) critical habitat for species had been finalized, changing it from proposed to designated critical habitat. The following sections outline those changes and assess whether reinitiation of Section 7 consultation is warranted.

Cactus Ferruginous Pygmy-Owl

At the time of the BA and BO, cactus ferruginous pygmy-owl (*Glaucidium brasilianum*) was not included on the official IPaC species list; however, it is on the updated IPaC species list as a threatened species (USFWS 2025). On July 20, 2023, the USFWS published a Final Rule (which took effect on August 21, 2023) officially listing the cactus ferruginous pygmy-owl as threatened with a 4(d) rule under the ESA (USFWS 2023b). This project is well beyond the currently known range of the species, and the species is not likely to occur. The USFWS confirmed this in communications with the TNF regarding the "Tonto National Forest Land Management Plan" (Stewart 2023). Thus, Section 7 consultation for this species is not warranted.

Monarch Butterfly

At the time of the BA and BO, monarch butterfly (*Danaus plexippus*) was not included on the official IPaC species list; however, it is on the updated IPaC species list as a proposed threatened species (USFWS 2025). On December 12, 2024, the USFWS proposed listing of the monarch under the ESA as a threatened species with a 4(d) rule for take exceptions (USFWS 2024). Section 7 conference for proposed species is not required unless 1) the project may jeopardize the continued existence of the species or 2) the species is officially listed while the project is ongoing.

Huachuca Water-Umbel

At the time of the BA and BO, Huachuca water-umbel (*Lilaeopsis schaffneriana* var. *recurva*) was listed as endangered with critical habitat; however, it was not on the official IPaC species list because its range, at that time, did not include portions of the action area for the project. In April 2022, the USFWS updated the species' range information in the Environmental Conservation Online System (ECOS) to include portions of the species' historical range where the USFWS has information to believe that it may still occur under suitable habitat conditions (USFWS 2022b). Therefore, when the IPaC species list was updated in January 2025, the Huachuca water-umbel was included in the official species list (USFWS 2025). The USFWS's current range for this species now overlaps the southern portion of the action area along the San Pedro River in Pinal County, in particular the H&E Ranch (also known as H&E Farm) Clean Water Act (CWA) Compensatory Mitigation Parcel (Figure 7).

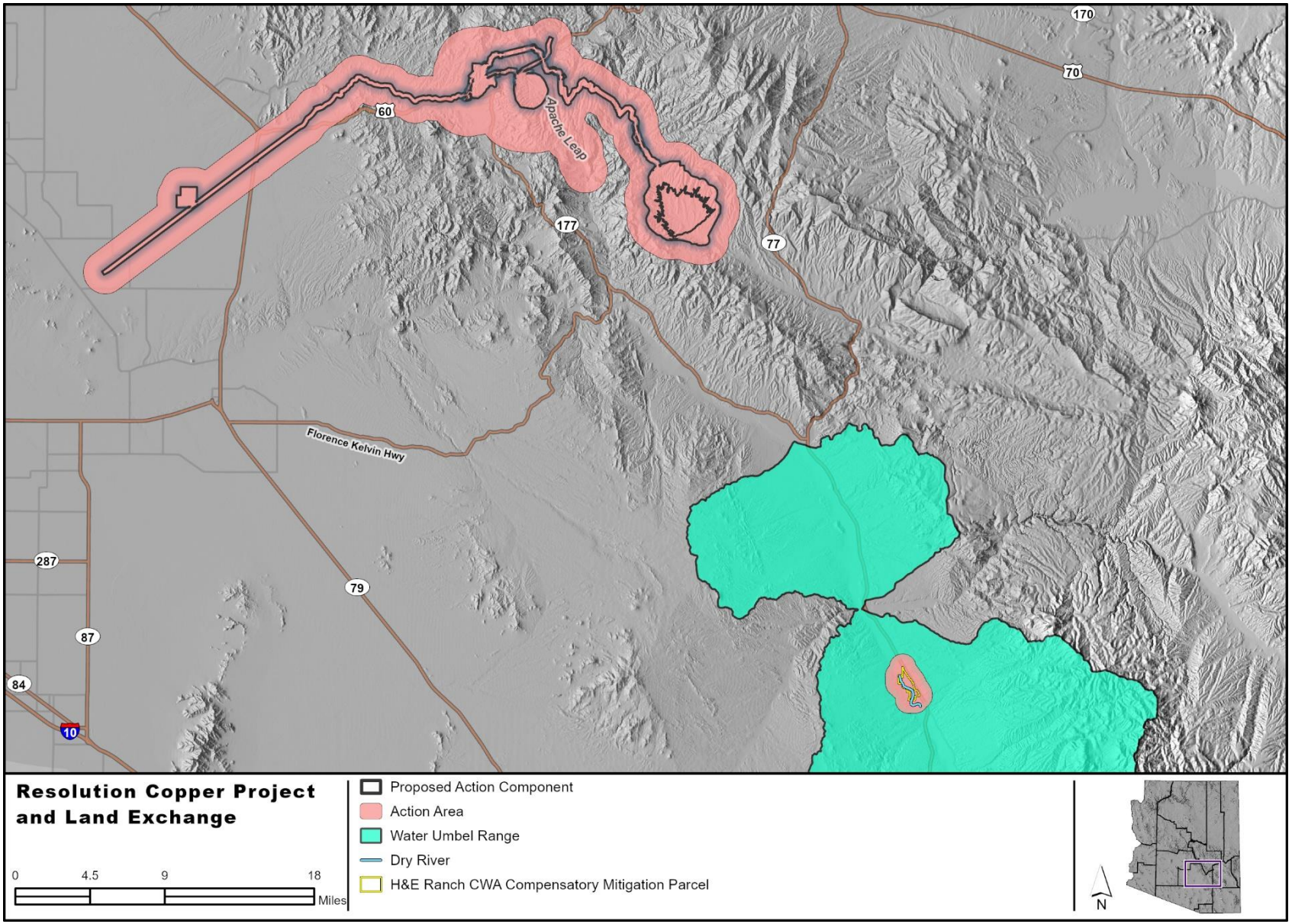

Figure 7. Range of the Huachuca water-umbel within the action area.

The USFWS Species Lead, Julie Crawford, indicated,

> The record in Pinal County is from the San Pedro River south of Winkelman . . . a collection from 1967. The recovery plan says this about that collection: "A 1967 herbarium specimen collected from the edge of a drying pool in the San Pedro River, 9.7 km (6 mi) south of Winkelman, documents an historical occurrence of *L. schaffneriana* ssp. *recurva* (Crutchfield 1967, entire). At some time close, but prior to, 2003, on several occasions, Priscilla Titus and others surveyed the Dudleyville Preserve, an area roughly 9.7 km (6 mi) south of Winkelman on the San Pedro River with aquatic habitat present; no *L. schaffneriana* ssp. *recurva* were found (Titus pers. comm. February 27, 2014b). In 2013, The Nature Conservancy published a Water Budget map (entire)[1] which clearly shows the area 9.7 km (6 mi) to the south of Winkelman has perennial flow. Additional surveys are warranted. (Crawford 2022)

The USFWS describes suitable habitat for the Huachuca water-umbel as "shallow and slow-flowing waters that are relatively stable, or in active/stream channels containing refugial sites where the plants can escape the effect of scouring floods" (USFWS 2017:v) and "perennial, shallow, and slow-flowing or quiet waters or in active stream channels containing refugial sites where most plants can escape the effect of scouring floods" (USFWS 2017:11), within an elevation range of 2,001 to 7,060 feet above mean sea level.

WestLand conducted a site visit to the H&E Ranch and described the parcel as including "an approximately 2-mile-long low-gradient, braided intermittent reach of the San Pedro River. The river floodplain and terrace to the east of the river is comprised of former agricultural fields currently used for cattle grazing and associated ranching activities. Existing vegetation within the historic agricultural fields is sparse and consists of small to medium-statured mesquite and graythorn (*Ziziphus obtusifolia*). Vegetation along the active channel at the H&E Farm mitigation site consists of narrow, dense stands of mesoriparian and xeroriparian trees and shrubs. Species include large-statured mesquite (*Prosopis* sp.) and tamarisk, with a few individual cottonwoods (*Populus* sp.) and interspersed patches of singlewhorl burrobush (*Ambrosia monogyra*)" (WestLand 2020b:18–19). A qualitative assessment of aquatic function was conducted for the proposed terrace and wetland mitigation areas that concluded the following (WestLand 2020b:23–26):

- Hydrologic Connectivity: This mitigation area is located between the uplands and the San Pedro River . . . . [The] site includes an area of historic agricultural fields immediately adjacent to existing wetlands in the San Pedro River channel, a large, well-defined, multi-threaded, low-gradient channel. The channel lacks major impediments to flow and is capable of transporting high volumes of water.
- Subsurface Flow/Groundwater Recharge: The compacted soils of these agricultural fields prevent normal subsurface flow, as evidenced by sinkholes in field structure. The adjacent San Pedro River mainstem possesses quaternary alluvial and surficial deposits, has relatively shallow (20 to 50 ft bgs [below ground surface]) depth to groundwater, and the existing wetland characteristics show subsurface flow and potential to replenish groundwater aquifers.

[1] SWCA was unable to obtain this 2013 map from The Nature Conservancy (TNC) and requested it from Julie Crawford, Species Lead, USFWS. She sent the map; however, the map is dated 2008. SWCA requested clarification regarding the date with Julie Crawford and she stated, "That is the only thing in my files, so it was likely a typo on my part or perhaps I wrote the date I accessed it?" SWCA believes that the perennial flows mentioned in that statement were actually from 2008 and not 2013, but we cannot be certain. Regardless, the H&E Ranch parcel on that map is shown as "Dry."

- Energy Dissipation: The San Pedro River mainstem channel has some sinuosity, is low-gradient, and possesses alluvium capable of reducing flow intensities through evaporation, channel infiltration, and natural physical control features. The river has a well-developed floodplain. The compacted soils of these agricultural fields impede normal energy dissipation for this landform.
- Sediment Transport/Regulation: The compacted soils of these agricultural fields interfere with normal sediment transport/regulation for this landform. Braided channels with well-sorted bed material and primarily unrestricted floodplains can retain and deposit large amounts of sediment during precipitation events. (WestLand 2020b:23–26)

Arizona Department of Environmental Quality maps describe the flow regime of the San Pedro River within H&E Ranch as "Intermittent" (Arizona Department of Environmental Quality 2025). TNC's San Pedro River Wet-Dry Maps depict the flow regime of the river within H&E Ranch and the greater action area from 2007 through 2022 as "Dry" (Table 5, Figure 8) (TNC 2024). Furthermore, other maps from the work TNC does along the San Pedro River do not categorize the portion of the San Pedro River within H&E Ranch as formerly perennial (Haney 2005; TNC 2010). Lastly, the perennial stretch of the San Pedro River that the USFWS mentions in the recovery plan (USFWS 2017) is considerably north of H&E Ranch.

Table 5. San Pedro River Wet-Dry Map Data for the Portion of the River within the Action Area, Including the H&E Ranch CWA Compensatory Mitigation Parcel

Year	Category	Miles
2007	Dry River	2.407
2008	Dry River	3.335
2009	Dry River	1.655
2010	Dry River	1.994
2011	Dry River	2.891
2012	Dry River	3.335
2013	Dry River	3.335
2014	Dry River	3.335
2015	Dry River	3.335
2016	Dry River	3.335
2017	Dry River	3.335
2018	Dry River	3.012
2019	Dry River	2.941
2020	Not available	Not available
2021	Dry River	3.862
2022	Dry River	2.732

Source: TNC (2024)

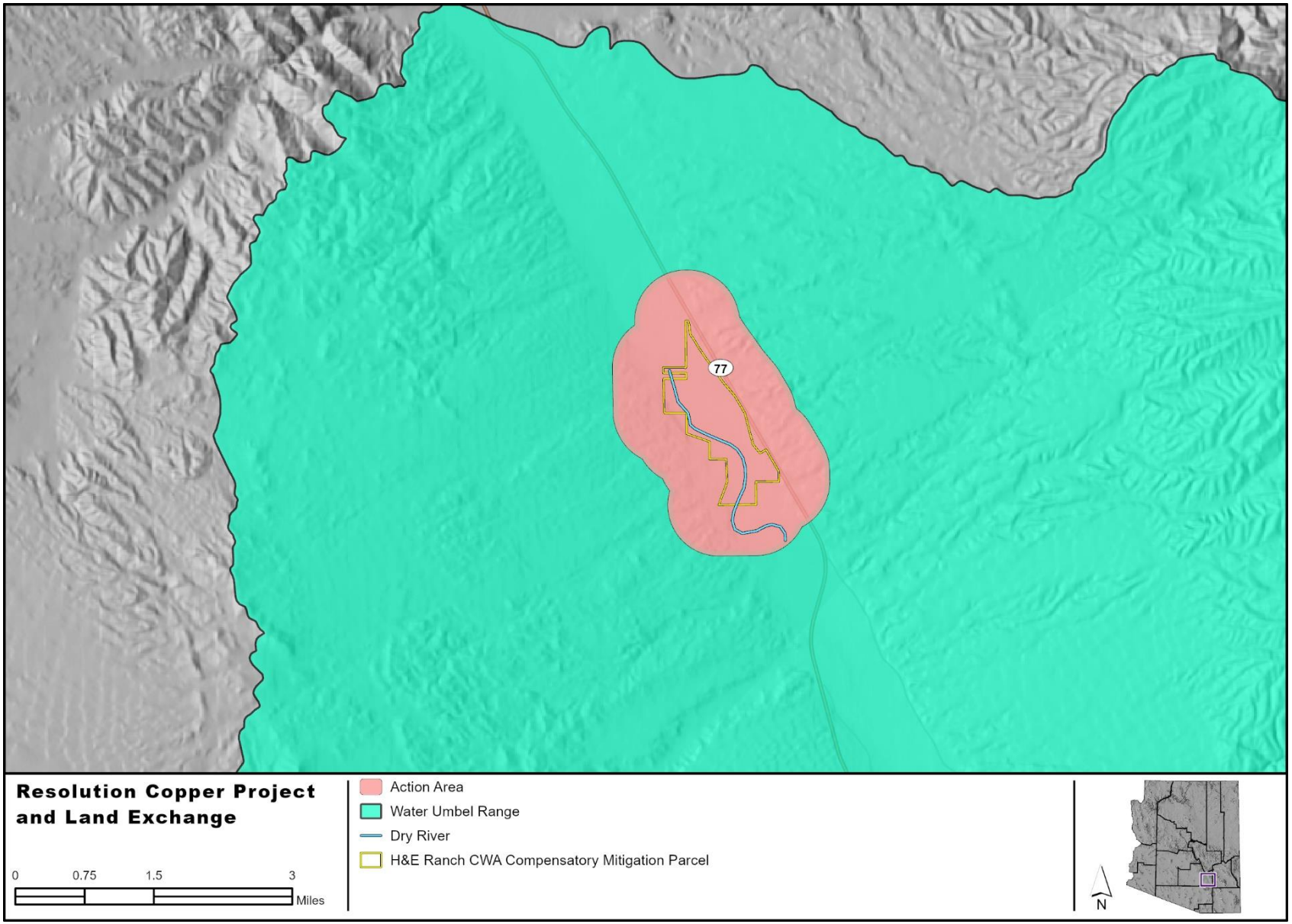

Figure 8. San Pedro River wet-dry mapping (TNC 2024) within the action area and H&E Ranch.

From assessing the available data, regarding the 1967 herbarium specimen along the San Pedro River that Julie Crawford pointed out in her personal communication with SWCA, that location is north of H&E Ranch in an area that sometimes does contain perennial flows. The portion of the San Pedro River within H&E Ranch does not currently have, nor has it had in the past, the perennial flows required by Huachuca water-umbel; therefore, this species is unlikely to occur. Thus, Huachuca water-umbel would not be affected, and reinitiation of Section 7 consultation with the USFWS for the Resolution Copper Project is not be warranted. Also, any future ESA compliance for the H&E Ranch would be the responsibility of the U.S. Army Corps of Engineers (USACE) under its CWA obligations.

Northern Mexican Gartersnake Critical Habitat

The 2020 BA concluded that the proposed action may affect but is not likely to adversely affect northern Mexican gartersnake (*Thamnophis eques megalops*) and its proposed critical habitat, and the 2020 BO concurred with this effect determination. At the time of preparation of the BA and BO, northern Mexican gartersnake was listed as threatened with proposed critical habitat. The USFWS concurred with the "no effect" BA determination for proposed critical habitat within the H&E Ranch CWA Compensatory Mitigation Parcel. On May 28, 2021, the USFWS designated critical habitat for the species (USFWS 2021c). The final designated critical habitat for northern Mexican gartersnake does not include critical habitat on H&E Ranch; thus, no designated critical habitat for northern Mexican gartersnake is present in the project area or action area. Therefore, no additional consultation with the USFWS is warranted for this species. Also, any future ESA compliance for the H&E Ranch would be the responsibility of the USACE under its CWA obligations.

Yellow-Billed Cuckoo Critical Habitat

The 2020 BA concluded that the proposed action may affect but is not likely to adversely affect the yellow-billed cuckoo (*Coccyzus americanus*) and its proposed critical habitat, and the 2020 BO concurred with this effect determination. At the time of preparation of the BA and BO, the yellow-billed cuckoo was listed as threatened with proposed critical habitat, which the BA addressed. Since that time, the USFWS has designated critical habitat for this species (USFWS 2021d). The proposed designation did not differ from the final designation (Figures 9 and 10). The USFWS concurred with the BA determination of "may affect, but is not likely to adversely affect" for the proposed critical habitat within the H&E Ranch CWA Compensatory Mitigation Parcel; thus, no additional consultation with the USFWS is warranted for this species. Also, any future ESA compliance for the H&E Ranch would be the responsibility of the USACE under its CWA obligations.

Although the Telegraph Fire did burn within portions of and near yellow-billed cuckoo designated critical habitat along Mineral Creek within the action area (see Figure 4), and some of the baseline conditions within the action area may have changed due to the Telegraph Fire, the conclusions of the 2020 BA and BO remain valid. This is because 1) Dripping Springs Road and its crossing of Mineral Creek is maintained by Gila County, and if repairs were needed, then Gila County would need to address any impacts through its own analysis; 2) this proposed action analysis included a larger corridor for access using Dripping Springs Road and thus over-accounted for the likely level of impact; and 3) if the Telegraph Fire did affect the watershed through erosion and sedimentation, with associated changes to baseline conditions, the conclusions of the BA and BO regarding yellow-billed cuckoo and its designated critical habitat would not be altered because the proposed action includes best management practices to control erosion and sediment from construction. In summary, the Telegraph Fire alterations to baseline conditions do not change the conclusions of the BA and BO.

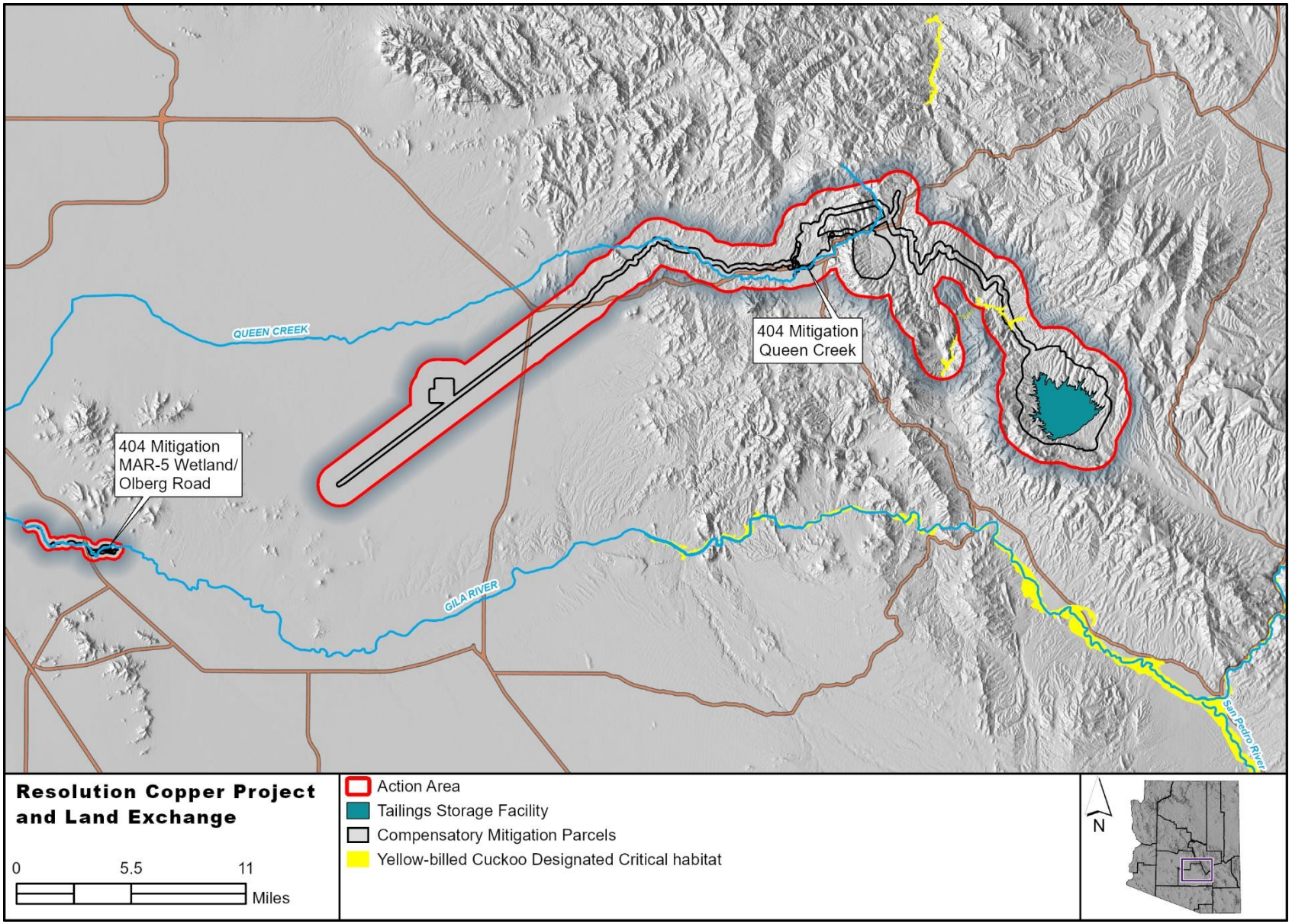

Figure 9. Yellow-billed cuckoo designated critical habitat within the action area.

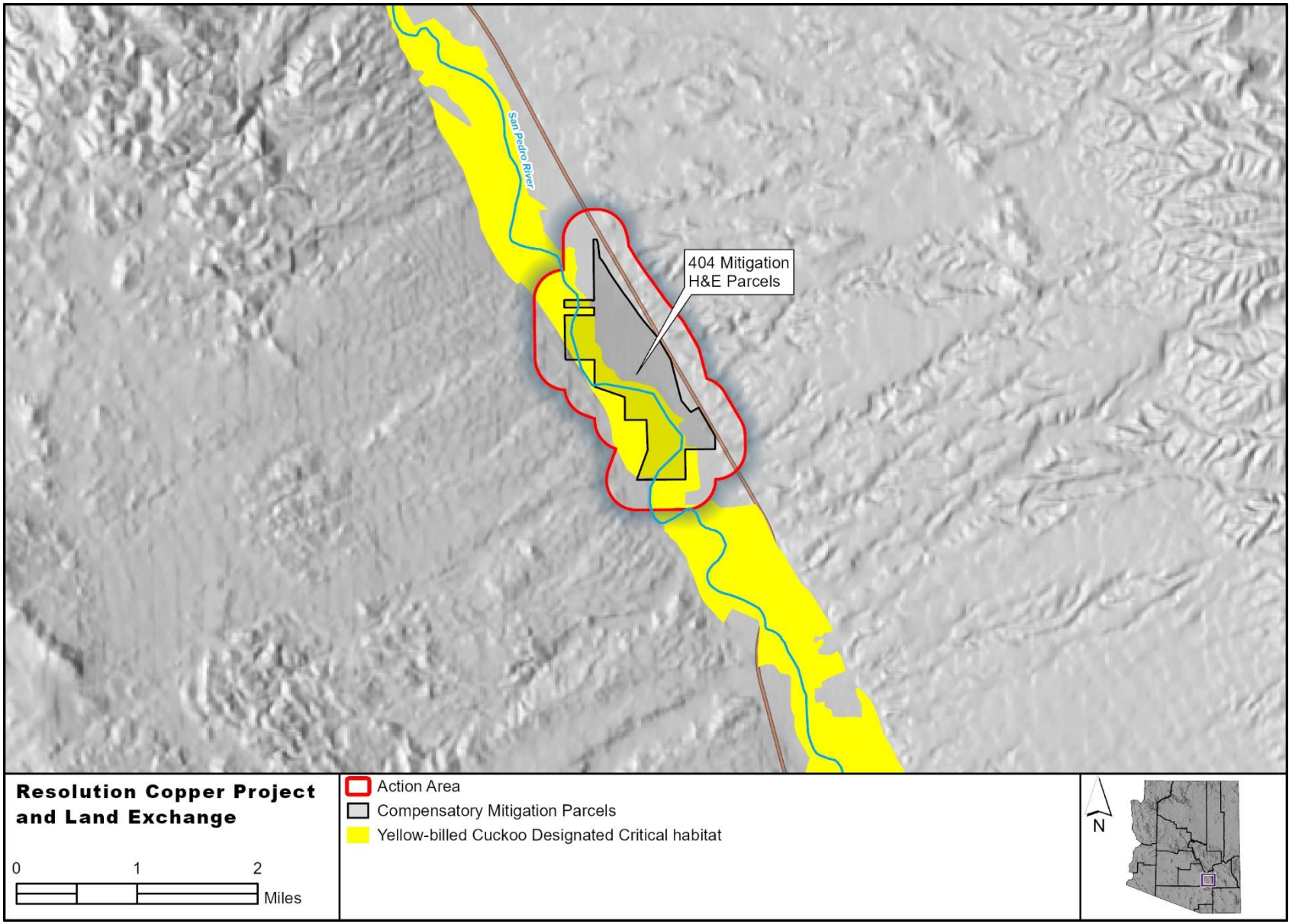

Figure 10. Yellow-billed cuckoo designated critical habitat within H&E Ranch.

SUMMARY AND CONCLUSIONS

The analysis presented in this report has shown that reinitiation of Section 7 consultation for the Resolution Copper Project is not warranted at this time. The following summarizes the findings of this report:

- The Telegraph Fire and Carlota Fire did not alter the conclusions of the BA and BO for the AHC; thus, those conclusions remain valid.
- To date, the pending changes for Gila chub have not been finalized; thus, the conclusions of the BA and BO remain valid.
- Although cactus ferruginous pygmy-owl was not addressed as a threatened species in the BA and BO, the project is well beyond the currently known range of the species; thus, consultation with the USFWS is not warranted.
- Although monarch butterfly was not addressed as a proposed threatened species in the BA and BO, the project will not jeopardize the continued existence of the species; thus, requesting a conference opinion from the USFWS is not required.
- Even though Huachuca water-umbel was not addressed in the BA and BO, the species is unlikely to occur and would not be affected by the Resolution Copper Project.
- The northern Mexican gartersnake critical habitat was designated after the BA and BO were completed; however, the final designation did not include any portions of the project area or action area. Thus, the conclusions of the BA and BO remain valid.
- The yellow-billed cuckoo critical habitat was designated after the BA and BO were completed; however, it was addressed in those documents as proposed. Thus, the conclusions of the BA and BO remain valid.
- Any future ESA compliance for the H&E Ranch would be the responsibility of the USACE under its CWA obligations.

SWCA recommends that if any of the Section 7 reinitiation requirements are triggered, then the Forest Service should begin communication with the USFWS regarding what is required. The triggers include the following:

> 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion or written concurrence; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. (USFWS 2020:55)

The most likely scenario to trigger reinitiation would be if the USFWS lists the monarch, or any other species that could occur and be affected by the project, as threatened under the ESA at any time during the life of the Resolution Copper Project. In that case, the Forest Service would prepare a supplemental BA and request reinitiation of Section 7 consultation with the USFWS.

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APPENDIX A

Post–Telegraph Fire Assessment of Arizona Hedgehog Cacti near Superior, Arizona (WestLand Resources, Inc.)

Post-Telegraph Fire Assessment of Arizona Hedgehog Cacti near Superior, Arizona

Prepared for:

RESOLUTION COPPER

Resolution Copper
102 Magma Heights – Superior, Arizona 85173

Prepared by:

WestLand Engineering & Environmental Services
4001 E. Paradise Falls Drive – Tucson, Arizona 85712
+1 520-206-9585

WestLand Project Number: 807.254

June 1, 2022

WestLand 100% EMPLOYEE OWNED | Engineering & Environmental Services

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Appendices

Appendix A. Arizona Hedgehog Cactus Transplants at the JI Ranch: ESA Section 7 Conservation Measure 02EAAZ00-2020-F-0822
Appendix B. Representative Photographs

1. INTRODUCTION AND BACKGROUND

WestLand Engineering and Environmental Services (WestLand) was retained by Resolution Copper (Resolution) to assess the impacts of the Telegraph Fire on Arizona hedgehog cactus (AHC; *Echinocereus triglochidiatus* var. *arizonicus*) located east of the town of Superior in Pinal County, Arizona (**Figure 1**). As part of this effort, WestLand conducted post-fire sampling of AHC in the vicinity of the Proposed Project Area, Agency Preferred Alternative, and JI Ranch as described in the *FINAL Environmental Impact Statement Resolution Copper Project and Land Exchange* (USDA 2021). The Telegraph Fire was a wildfire ignited on June 4, 2021 and eventually fully contained on July 3, 2021 with a final mapped fire perimeter of 180,757 acres, as reported by the Tonto National Forest (TNF; InciWeb 2021, accessed online 2/15/2022). The mapped burn area includes portions of the Proposed Project Area, Agency Preferred Alternative, and JI Ranch. The Proposed Project Area and Agency Preferred Alternative are referred to collectively in this document as the "Project Area." The Project Area comprises individual components including the East Plant Site, 230-kV Powerline Corridor, and Tailings Pipeline Corridor. JI Ranch is a 272-acre property owned by Resolution that is known to support AHC habitat, approximately 100 acres of which is intended for use as an AHC conservation area (USFWS 2020). Resolution has conducted AHC propagation activities at JI Ranch since 2011, including transplanting propagated AHC into natural habitat onto the property in 2016 and 2020. A summary of the 2016 and 2020 AHC transplanting efforts at JI Ranch is provided in **Appendix A**.

To inform the post-fire assessment, WestLand conducted post-fire sampling of AHC known to occur within and in the vicinity of the East Plant Site, the 230-kV Powerline Corridor, and JI Ranch (**Figure 1**). The post-fire sampling was conducted from October 11 to 22, 2021, approximately 4 months after the Telegraph Fire was extinguished. The plant sampling methodology includes evaluations of survivorship, health, and the presence of fire damage to plant tissue. In addition to AHC sampling, WestLand conducted ground truthing efforts comparing TNF fire perimeter and burn severity mapping data to burn conditions observed in the field. The results of the ground truthing efforts were used to make inferences regarding the survivorship and health status of AHC documented by WestLand prior to the Telegraph Fire but located outside of the burn perimeter mapped by the TNF. The post-fire AHC sampling results were combined with WestLand's separate pre- and post-fire AHC survey data to assess the post-fire status of AHC located within the Project Area and at JI Ranch. Representative photographs depicting AHC habitat and individuals documented during the post-fire sampling efforts are provided in **Appendix B**.

The remaining sections in this document provide: background information specific to AHC (**Section 2**); a description of the post-fire assessment methods (**Section 3**); and the post-fire assessment results (**Section 4**). References cited are included in **Section 5**.

2. ARIZONA HEDGEHOG CACTUS BACKGROUND

AHC is federally listed under the Endangered Species Act (ESA) as endangered without critical habitat (USFWS 1979b). Draft recovery plans for the species have been developed (Baker 2013, Fletcher 1984,

USFWS 1991) but have not yet been finalized. In 2019, the U.S. Geological Survey in cooperation with the U.S. Fish and Wildlife Service (USFWS) and Arizona Ecological Services published an open file report compiling and assessing available AHC survey and monitoring data to support the recovery of the species (Thomas et al. 2019). AHC is also protected by the Arizona State Legislature (A.R.S. Chapter 7, Arizona State Legislature 2019) as a Highly Safeguarded Native Plant and is protected from international trade by the Convention of International Trade in Endangered Species (UNEP-WCMC 2014).

AHC was initially collected in 1922 near the Gila and Pinal County boundary, between Superior, Arizona and Miami, Arizona (type locality), and named *Echinocereus arizonicus* in 1926 (Orcutt 1926). AHC was included as variety *arizonicus* in one of eight varieties of *E. triglochidiatus* in *The Cacti of the United States and Canada* (Benson 1982). AHC has also been named *E. coccineus* var. *arizonicus* (Ferguson 1989), but more recent studies have proposed *E. arizonicus, E. coccineus* and *E. triglochidiatus* as separate species based on morphology, number of chromosomes, molecular studies, and habitat (Baker 2006, Blum et al. 1998, Zimmerman and Parfitt 2003). The PLANTS Database, U.S. Department of Agriculture (USDA), refers to Ferguson (1989) in naming AHC *E. coccineus* var. *arizonicus* (NRCS 2021, accessed 11/24/2021). However, based on Baker's (2006) report of *E. coccineus* being tetraploid and *E. arizonicus* being a diploid species, Ferguson's (1989) classification appears to be incorrect. Two online databases, Interagency Taxonomic Information System, which serves as a standard for classifications that has gained broad acceptance in taxonomic literature, and Nature Serve Explorer, which provides information about rare and endangered species, accept *E. arizonicus* as correct (ITIS 2021, NatureServe 2021, websites accessed 11/24/2021). The Flora of North America refers to the variety as a subspecies of *E. arizonicus* (Zimmerman and Parfitt 2003). While revisions to the taxonomy of AHC may need to be addressed at the federal level, AHC is currently listed under the ESA as *E. triglochidiatus* var. *arizonicus* (USFWS 1979b), and this document follows that nomenclature.

AHC is a green succulent with cylindroid stems and brilliant red flowers (AGFD 2020, Thomas et al. 2019). Stems occur singly or most often in clusters of four to twenty (AGFD 2020), though up to 143 stems have been recorded on a single individual (Baker 2013). Stems are robust, averaging 3 inches in diameter but commonly exceeding 4 inches, and are generally longer than the stems of similar varieties of hedgehog cacti (AGFD 2020). Stems have an average of nine ribs (AGFD 2020, Baker 2013). Spines are smooth and occur on areoles, with each areole containing an average of nine radial spines and three central spines (Baker 2013). Central spines are thick, averaging nearly 1 millimeter (mm) in diameter (Baker 2013). The largest central spine per areole is typically deflexed (pointed downwards) (AGFD 2020). Relative to other *Echinocereus*, AHC spines are shorter and more robust (AGFD 2020). Flowers occur on the upper-third of stem ribs (AGFD 2020) and are stout, mostly erect, and measure up to 16 mm broad and 93 mm long (Baker 2013). The reported flower blooming period ranges from mid-April to mid-May (AGFD 2020, Baker 2013).

AHC occupies portions of the highlands of Pinal and Gila Counties between Superior and Globe, Arizona. Its known range extends from the Superstition Wilderness south to Devils Canyon, east along U.S. 60 to

Top of the World and south to the Mescal and Pinal mountains (AGFD 2020, Baker 2013, Viert 1996). The range includes two small subpopulations, the Apache Peak subpopulation (which is likely of the Santa Rita hedgehog cactus species [*Echinocereus santaritensis*]) north of the city of Globe and the El Capitan subpopulation south of Globe (Baker 2013, Fehlberg 2013). Other varieties of red claret-cup cacti are intermingled with AHC at the edge of its distribution (Baker 2013), but only red claret-cup cacti near the type locality for AHC are considered "classical var. *arizonicus*", and these are the only populations subject to protection under the ESA (USFWS 1979a, Viert 1996).

The majority of predicted AHC habitat occurs on lands managed by TNF, with smaller portions of predicted habitat occurring on lands managed by the San Carlos Apache Tribe, Bureau of Land Management, ASLD, and private entities (Baker 2013). AHC commonly occurs from 3,300 ft to 5,700 ft but ranges up to 6,360 ft. (AGFD 2020) in Interior Chaparral and Madrean Evergreen Woodland habitats (Viert 1996) as mapped by Brown (1994). Suitable substrate includes bedrock open slopes where individuals occur in cracks and crevices and between boulders on stable rock formations such as Apache Leap Tuff, Schultze Granite and Pioneer Quartzite (Viert 1996). Pinal Schist, another rock type associated with AHC occupancy, weathers more rapidly and creates a soil substrate that is often colonized by dense stands of vegetation and is inhabited by AHC at lower densities (Baker 2013).

3. METHODS

This post-fire assessment was informed by a desktop evaluation of TNF Telegraph Fire perimeter (InciWeb 2021) and Geographic Information System burn severity mapping developed using Sentinel 2 satellite remote sensing data from June 13, 2021 and the Normalized Burn Ratio and differenced Normalized Burn Ratio algorithms described by the U.S. Department of Agriculture (Parsons et al. 2010). WestLand's pre-fire and post-fire AHC survey data was also used in the assessment. Pre-fire survey data includes AHC known to occur within the East Plant Site and the 230-kV Powerline and Tailings Pipeline corridors based on data reported in 2019 (WestLand 2019), AHC known to occur on TNF lands between JI Ranch and the Tailings Pipeline Corridor based on survey data collected from March 29 to May 7, 2021 (WestLand 2021), and previously unpublished survey data collected during a JI Ranch AHC inventory survey conducted from April 12 to 16, 2021. Post-fire survey data includes previously unpublished data collected during JI Ranch AHC inventory surveys conducted from August 23 to 26 and October 25 to 28, 2021, and data collected during post-fire AHC sampling within, and in the vicinity of, the Project Area and JI Ranch from October 11 to 15, 2021 and from October 19 to 22, 2021. The desktop assessment and field data collection methodologies used to inform the post-fire assessment are described in **Sections 3.1 and 3.2**, respectively.

3.1. DESKTOP ASSESSMENT

WestLand created a web map containing the TNF Telegraph Fire perimeter and burn severity mapping data described in **Section 3**. The burn severity mapping data was displayed as 67 by 67 feet (ft) pixels categorized as Low Severity, Moderate Low Severity, Moderate High Severity, and High Severity. Areas

within the TNF-mapped fire perimeter exhibiting very low or no burn severity according to the GIS mapping algorithm were not assigned a burn severity category. The Project Area components, the JI Ranch property boundary, and AHC known by WestLand to occur within the Project Area, JI Ranch, and/or within the mapped burn perimeter were added to the web map. WestLand used these AHC locations as the basis for post-fire AHC field sampling efforts described in **Section 3.2.1**.

3.2. FIELD DATA COLLECTION

WestLand collected field data using two methodologies: one for post-fire sampling conducted within and in the vicinity of the Project Area and JI Ranch; and the other for separate pre- and post-fire JI Ranch AHC inventory surveys.

3.2.1. Post-fire Sampling

WestLand collected post-fire survivorship and health data on a subset of the AHC identified during the Desktop Assessment (**Section 3.1)** from October 11 to 15, 2021 and from October 19 to 22, 2021. A total of 727 AHC were sampled (**Figure 1**). Sampled AHC includes all AHC detected in observed burn areas at JI Ranch (including areas outside of the TNF-mapped fire perimeter) and a subset of AHC known by WestLand to occur at the East Plant Site within the 230-kV Powerline Corridor and on TNF lands between JI Ranch and the Tailings Pipeline Corridor. Data collected for each live AHC sampled include:

- **Location**—locations were recorded using a handheld tablet with GPS capabilities.
- **Photographs**—close-up photographs of the plant's top and side, and an additional photograph of the plant in its landscape setting with surrounding habitat.
- **Health assessment**—plants were designated one of the following health categories:
  - Good—the plant is characterized predominantly by plump greens stems.
  - Fair—the plant is characterized predominantly by shrinkage or discoloration (due to fire damage or otherwise).
  - Poor—the plant is characterized primarily by necrosis (due to fire damage or otherwise).
- **Number of live stems**—a cumulative count of all living main stems, secondary stems, and pups.
- **Height**—a straight-line vertical measurement from the base of the plant to the upper-most portion of the plant (excluding spines and reproductive structures).[1] Measurements were recorded to the nearest mm.
- **Width**—a straight-line horizontal measurement across the widest portion of the plant (excluding spines and reproductive structures). Measurements were recorded to the nearest mm.
- **Plant herbivory**—estimated by percentage of the plant surface area exhibiting evidence of herbivory.

[1] Plant height was measured vertically for field measurement consistency. Because of this, the recorded heights of AHC growing on slopes may be exaggerated in some cases.

- **Fire damage**—estimated by percentage of the plant surface area exhibiting burnt plant tissue.
- **Expected mortality due to fire**—a qualitative field assessment of the likelihood of plant mortality due to fire damage, substantiated by rationale. Categories: None, Low, Medium, High, Already Dead.

Dead plants were also recorded, along with Location, Photographs, and Fire damage data.

Surveyors also recorded a burn severity assessment of the landscape within a 33-ft radius of each plant location. The burn severity assessment was based on the characteristics of Soil Burn Severity Class Factors described in Appendix E of the *Field Guide for Mapping Post-Fire Soil Burn Severity* (Parsons et al. 2010). The burn severity assessment categories assigned in the field include Low Severity, Moderate Low Severity, Moderate High Severity, High Severity, and Unburned. While sampling AHC surveyors also performed periodic ground truthing of the TNF-mapped fire perimeter.

3.2.2. JI Ranch Inventory Surveys

The JI Ranch AHC inventory survey data used in this assessment includes all AHC detected within the JI Ranch property boundary but outside of the observed burn areas identified during the AHC-post fire sampling activities described in **Section 3.2.1**. The inventory survey data were collected from April 12 to 16, August 23 to 26, and October 25 to 28, 2021. Data collected for each live AHC recorded during the inventory surveys includes Location, Photographs, Health assessment, Number of live stems, Height, Width, and Plant herbivory, as described in **Section 3.2.1**. Dead plants were also recorded, along with Location and Photographs.

4. RESULTS

4.1. RESOLUTION PROJECT AREA

AHC known by WestLand to occur within the Project Area based on the desktop assessment are shown in **Figure 2**. None of the AHC sampled within the Resolution Project Area (**Figure 3**) exhibited fire damage. Observations recorded during ground truthing efforts indicated that the TNF-mapped fire perimeter was generally accurate, with a maximum observed distance of approximately 165 ft between the TNF-mapped fire perimeter and the field-verified burn perimeter. Surveyors also noted that the fire did not reach portions of the 230-kV Powerline and Tailings Pipeline corridors located north of U.S. 60 where the majority of AHC within the Project Area occur (**Figure 2**).

4.2. JI RANCH

The locations of all live AHC detected at JI Ranch based on pre- and post-fire data collection are shown in **Figures 3 and 4**. Live AHC recorded after the Telegraph Fire includes those within the observed burn perimeter and all AHC located on the JI Ranch property north of U.S. 60, where no evidence of fire damage was observed. Live AHC recorded from April 12 to 16, 2021 (before the Telegraph Fire) includes AHC

located on the JI Ranch property south of U.S. 60 but outside of the observed burn perimeter. WestLand infers that these live AHC recorded prior to the Telegraph Fire but located outside of the observed burn perimeter survived the effects of the Telegraph Fire. Based on these data and inference, 1,062 live AHC were documented on JI Ranch in 2021, and these individuals survived the effects of the Telegraph Fire. The health status of these 1,062 cacti are shown in **Figure 4**. Four hundred and sixteen AHC located within the observed burn perimeter survived the Telegraph Fire as assessed from October 11to 22, 2021. Two hundred and eight of these AHC (50%) were determined to be in Good health, 146 (35%) were determined to be in Fair health, a 62 were determined to be in Poor health (15%).

4.3. AHC SURVIVORSHIP AND GIS BURN SEVERITY MAPPING DATA

This subsection provides the results of AHC post-fire survivorship in areas containing burn severity mapping data described in **Section 3**. These data may broadly inform future analyses of AHC survivorship in other areas affected by the Telegraph Fire. One hundred and thirty-six of the AHC surveyed during the October 11to 22, 2021 post-fire sampling efforts are located within mapped burn severity pixels. AHC survivorship by mapped burn severity category is presented in **Table 1**. Important to note is that high plant density, GPS accuracy limitations, and fire damage to plants and plant identification tags made it impossible in some cases for surveyors to match individual plants sampled after the fire to data recorded on the same individual plants during pre-fire surveys. As a result, some plants recorded as dead during the post-fire sampling may have already been dead prior to the Telegraph Fire, and some plants recorded during the post-fire sampling may not have been detected during pre-fire surveys.

Table 1. AHC Survivorship in Mapped Burn Severity Category

Mapped Burn Severity Category	# Live AHC	# Dead AHC	Total	% Survivorship
Low	86	19	105	82%
Moderate Low	14	12	26	54%
Moderate High	2	3	5	40%

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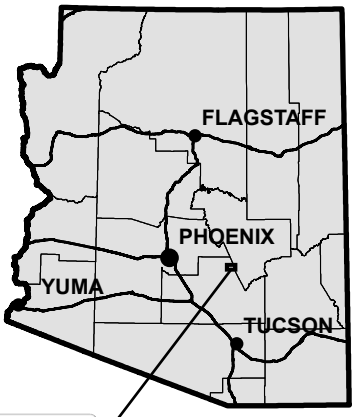
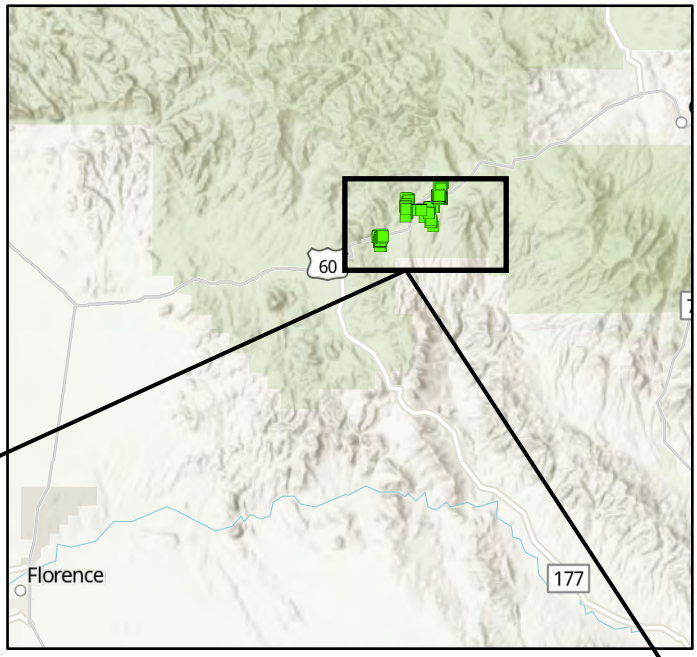
FIGURES

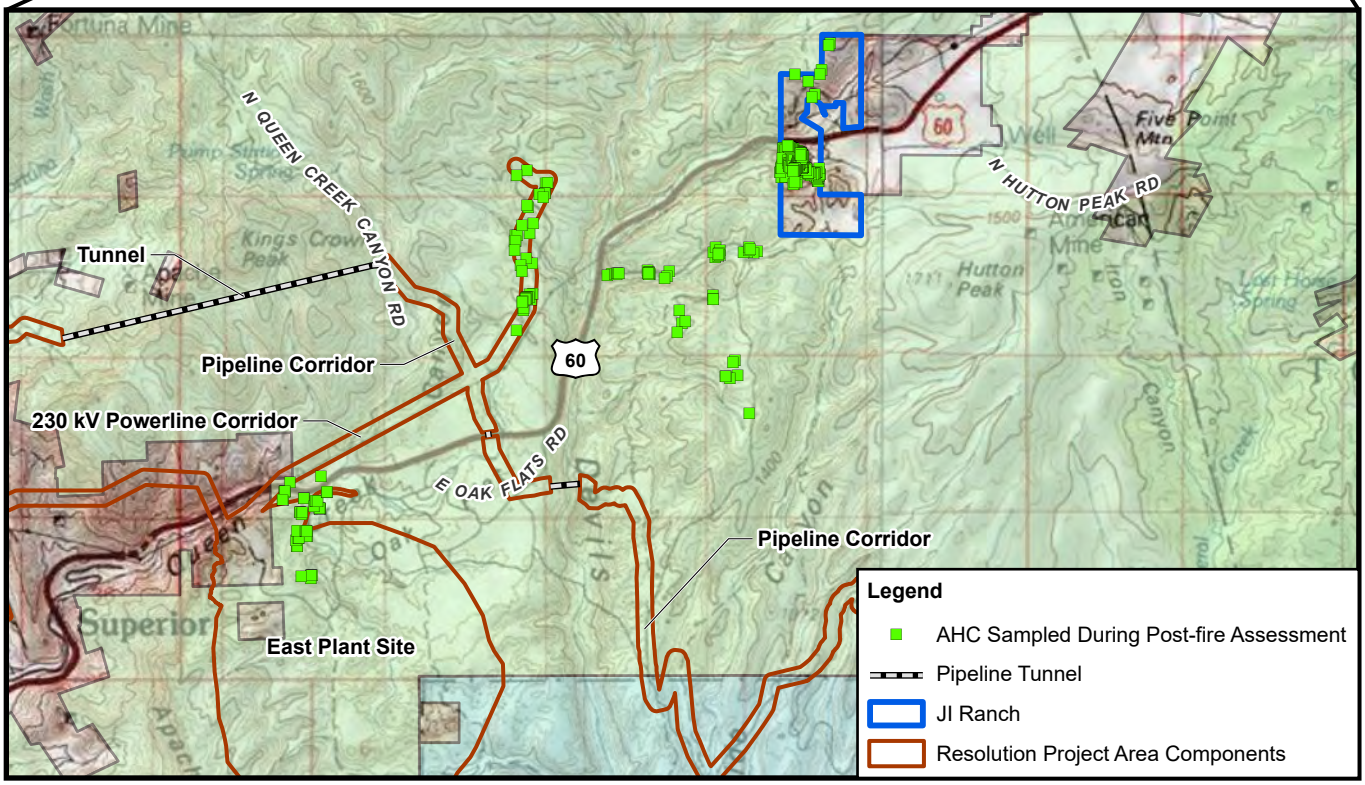
ARIZONA



PROJECT VICINITY



Approximate Scale 1 inch equals 10 miles



T1S, R13E, Portions of Sections 14-16, 21-23, 26, 29, and 32,
Pinal County, Arizona,
Mesa 1:100,000 USGS Quadrangle
Surface Management: BLM 2019 (WRI Modified 2019)
Image Source: ArcGIS Online, World Topographic Map

N

0 0.6 1.2 Miles

0 1 2 Kilometers

WestLand
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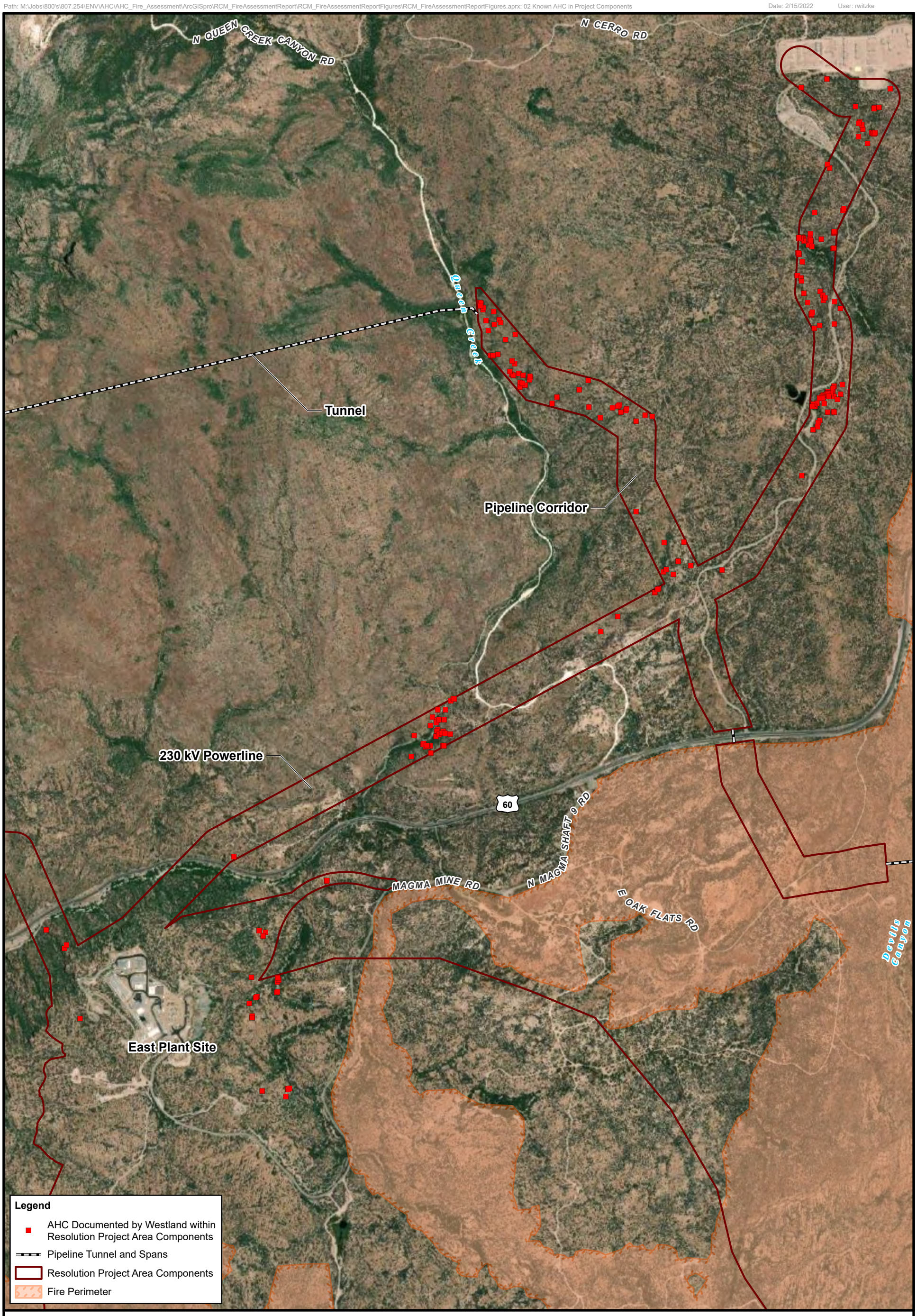
Engineering & Environmental Services

RESOLUTION COPPER
AHC Telegraph
Fire Assessment Report

VICINITY MAP
Figure 1



AHC Within:
T1S, R13E, Portions of Sections 15, 16, 21, 22, 28-30, and 32,
Pinal County, Arizona
Image Source: Maxar 05/20/2020
Data Source: USFS Fire Intensity Mapping and Burn Perimeter

N

0 600 1,200 Feet

0 200 400 Meters

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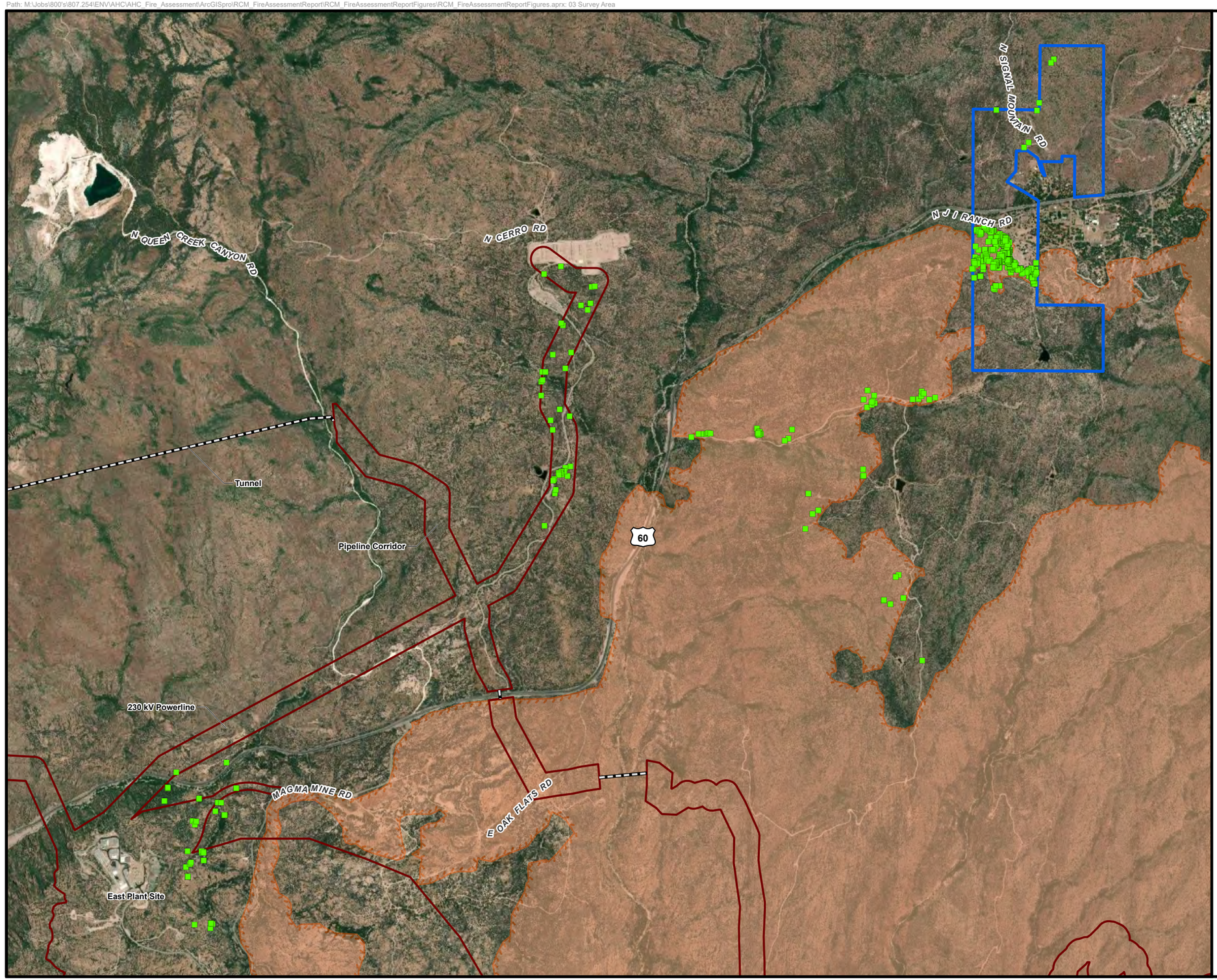
AHC Telegraph Fire Assessment Report

KNOWN AHC WITHIN THE
RESOLUTION EIS PROJECT AREA COMPONENTS

Figure 2



T1S, R13E, Portions of Sections 14-16, 21-23, 26, 29, and 32, Pinal County, Arizona
Image Source: Maxar 05/20/2020
Data Source: USFS Fire Intensity Mapping and Burn Perimeter

Legend

- AHC Sampled During Post-fire Assessment
- Pipeline Tunnel and Spans
- JI Ranch
- Resolution Project Area Components
- Fire Perimeter

N

0 1,000 2,000 Feet

0 300 600 Meters

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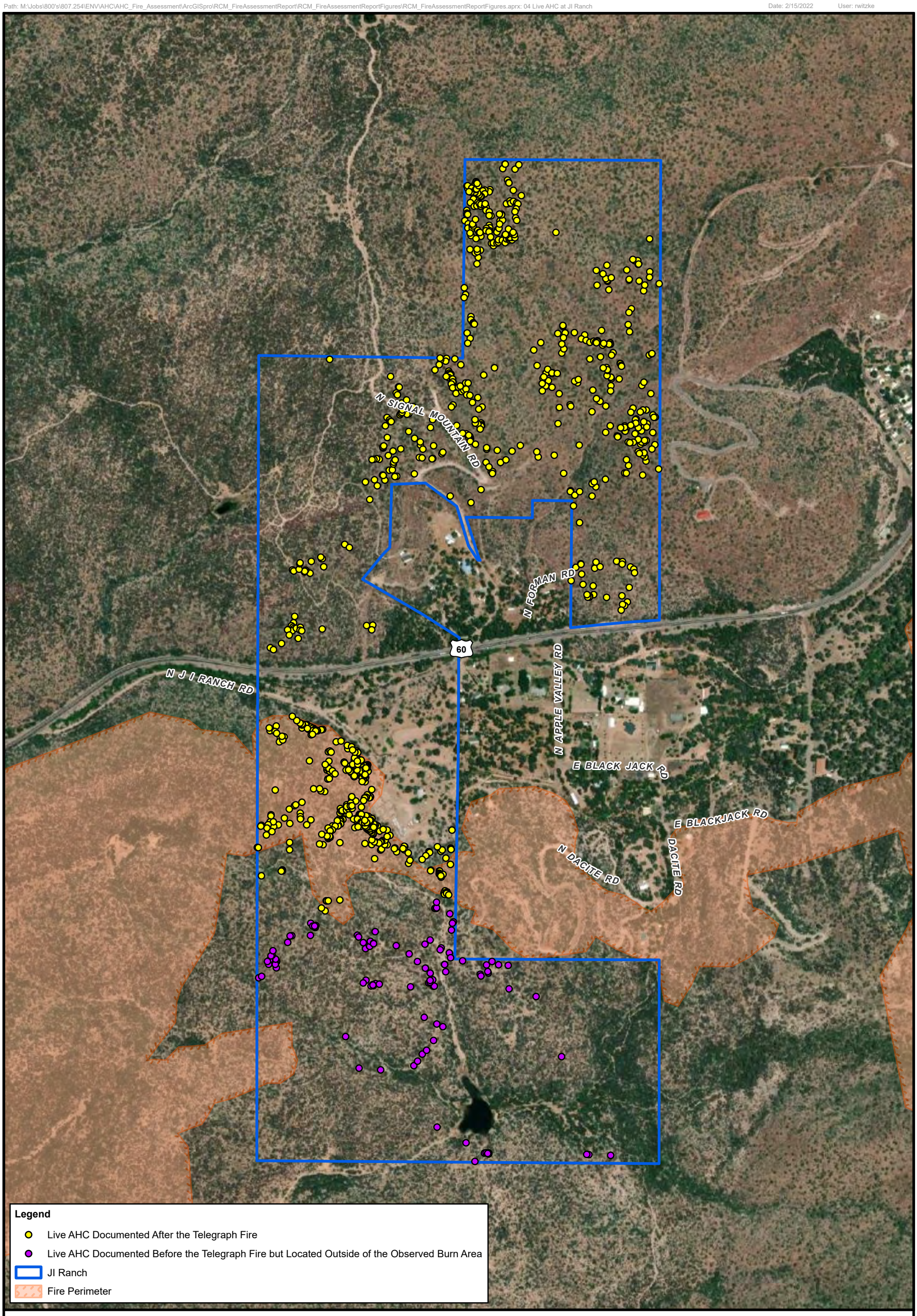
AHC Telegraph
Fire Assessment Report

AHC SAMPLED DURING
POST-FIRE ASSESSMENT

Figure 3



JI Ranch Within:
T1S, R13E, Portions of Sections 14 and 23,
Pinal County, Arizona
Image Source: Maxar 05/20/2020
Data Source: USFS Fire Intensity Mapping and Burn Perimeter

N
0 300 600 Feet
0 100 200 Meters

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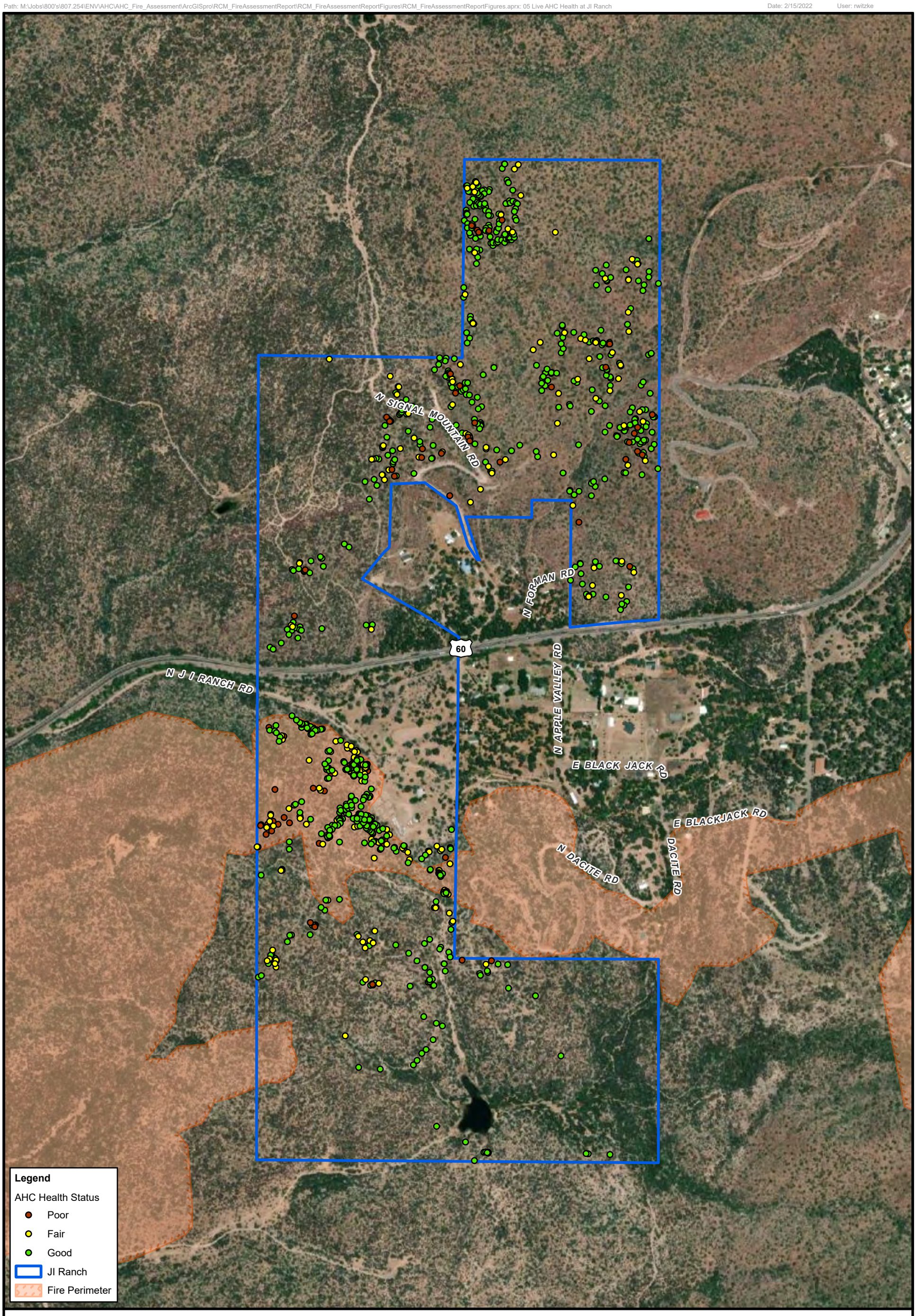
RESOLUTION COPPER

AHC Telegraph
Fire Assessment Report

LIVE AHC AT JI RANCH

Figure 4



JI Ranch Within:
T1S, R13E, Portions of Sections 14 and 23,
Pinal County, Arizona
Image Source: Maxar 05/20/2020
Data Source: USFS Fire Intensity Mapping and Burn Perimeter

N

0 300 600 Feet

0 100 200 Meters

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RESOLUTION COPPER

AHC Telegraph
Fire Assessment Report

LIVE AHC AT JI RANCH WITH HEALTH STATUS

Figure 5

APPENDIX A
AHC Transplants at the JI Ranch:
ESA Section 7 Conservation Measure
02EAAZ00-2020-F-0822

Arizona Hedgehog Cactus Transplants at the JI Ranch

Prepared for:

Resolution Copper
102 Magma Heights – Superior, Arizona 85173

Prepared by:

WestLand Engineering & Environmental Services, Inc.
4001 E. Paradise Falls Drive – Tucson, Arizona 85712
+1 520-206-9585

WestLand Project Number: 807.254

March 3, 2022

WestLand 100% EMPLOYEE OWNED Engineering & Environmental Services

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Figure 2. JI Ranch Transplanted AHC with Added Treatment Transplant Locations

1. INTRODUCTION

Resolution Copper (Resolution) has proposed to develop conservation lands for the federally endangered Arizona hedgehog cactus (AHC; *Echinocereus triglochidiatus* var. *arizonicus*; USFWS 1979) as part of conservation measures brought forward in support of Endangered Species Act (ESA) Section 7 Consultation (No. 02EAAZ00-2020-F-0822). AHC has been documented within the proposed disturbance limits of Resolution activities.[1] The U.S. Forest Service (USFS) submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (USFWS) in June 2020 (USDA 2020), and the USFWS subsequently concluded that the Project is likely to adversely affect AHC (USFWS 2020). In response, Resolution has proposed the conservation of roughly 100 acres of private lands located in Pinal County, Arizona within an area known as JI Ranch (Project Area; **Figure 1**). Resolution has propagated AHC at the JI Ranch since 2011 and has previously transplanted AHC into the Project Area in 2016 (WestLand 2016c). Resolution retained WestLand Engineering & Environmental Services (WestLand) in 2020 to transplant the remaining AHC propagated by Resolution onto JI Ranch.

2. ARIZONA HEDGEHOG CACTUS

The AHC is federally listed under the Endangered Species Act (ESA) as endangered without critical habitat (USFWS 1979). AHC is also protected by the Arizona State Legislature (A.R.S. Chapter 7, Arizona State Legislature 2019) as a Highly Safeguarded Native Plant and is protected from international trade by the Convention of International Trade in Endangered Species (UNEP-WCMC 2014). While draft recovery plans for the species have been developed (Baker 2013, Fletcher 1984), a plan has yet to be finalized. In 2019, the U.S. Geological Survey (USGS), in cooperation with the USFWS and Arizona Ecological Services, published an open file report compiling and assessing available AHC survey and monitoring data to support the recovery of the species (Thomas et al. 2019).

AHC is a green succulent with cylindroid stems and brilliant red flowers (AGFD 2020, Thomas et al. 2019). Stems on AHC often occur in clusters of four to twenty stems, averaging 3 inches in diameter, and are generally longer than the stems of similar varieties of hedgehog cacti (AGFD 2020). Stems have an average of nine ribs (AGFD 2020, Baker 2013), with flowers occurring on the upper third of stem ribs (AGFD 2020). Relative to other *Echinocereus*, AHC spines are shorter and more robust (AGFD 2020). The reported flower

[1] WestLand has conducted numerous AHC surveys in the Project Area (defined in **Section 3**) and vicinity (WestLand 2004a, 2008, 2009, 2010, 2011a, b, 2013a, c, 2014a, 2016a, b, 2017, 2018, 2019, 2020a) and has detected AHC during surveys of the Pre-feasibility Action Area (WestLand 2021, 2008, 2010, 2013a, 2014a, 2016b, 2018), the East Plant Site (WestLand 2016a, 2017, 2020a), the 230-kV Powerline Corridor, and the Skunk Camp North Revised Corridor (WestLand 2020a [Figure 2], 2020b). In May 2020, an additional AHC survey was completed on approximately 100 acres of a since dismissed alternative powerline route that was being considered as part of the Skunk Camp North Revised Corridor. Ultimately, direct disturbance would be limited to access roads, pipeline placement (to be installed below grade where practicable), powerline structure footprints, and the mine subsidence area (or fracture limit, as described in the *FINAL Environmental Impact Statement Resolution Copper Project and Land Exchange*).

blooming period ranges from mid-April to mid-May (AGFD 2020, Baker 2013) and fruits from May to July (AGFD 2020).

The range of AHC extends from the Superstition Wilderness, south to Devils Canyon, east along US-60 to Top of the World, Arizona and south to the Mescal and Pinal mountains (AGFD 2020, Baker 2013, Viert 1996, WestLand 2013b), and it is known to occupy portions of the highlands in the Pinal and Gila counties between Superior and Globe, Arizona. The known range of AHC includes two small subpopulations: the Apache Peak subpopulation north of Globe, and the El Capitan subpopulation south of Globe (Baker 2013). The majority of AHC habitat occurs on lands managed by TNF, with smaller portions of predicted habitat occurring on lands managed by the San Carlos Apache Tribe, Bureau of Land Management, Arizona State Land Department, and private entities (Baker 2013).

AHC occurs from 3,300 to 5,700 feet above mean sea level (AMSL; AGFD 2020) in Interior Chaparral and Madrean Evergreen Woodland habitats, as mapped by Brown (1994). Suitable substrate includes bedrock open slopes where individuals occur in cracks and crevices and between boulders on stable rock formations such as Apache Leap Tuff, Schultze Granite, Pinal Schist, and Pioneer Quartzite (Viert 1996, WestLand 2013b). AHC occur at the highest densities in areas where boulders, exposed bedrock, and rock fissures are more common than a robust soil matrix (Viert 1996). Cedar Creek observed that AHC seemed to prefer shade for at least part of the day, although AHC also is generally found in areas with low shrub and herbaceous material in the vicinity (Viert 1996). An experimental manipulation of rocks and shade cover yielded high rates of survival for AHC exposed to both no rock cover and rock cover (Siegwarth 2014). For this reason, while AHC are often found in rocky areas that provide shade, it is unclear whether site selection is more dependent on the rocky substrate or if rocky substrate in conjunction with shade is preferred as microhabitat.

3. PROEJCT AREA

The Project Area is located within the proposed conservation easement at JI Ranch, located 5.9 miles northeast of Superior along U.S. Highway 60 in the Pinal Mountains (**Figure 1**). The vegetation community and geomorphology within the JI Ranch are consistent with the habitat associated with AHC. The Project Area is broadly mapped as Interior Chaparral (Brown 1994), and accordingly, the dominant plant species on the site include scrub live oak (*Quercus turbinella*) and pointleaf manzanita (*Arctostaphylos pungens*). Geomorphology at JI Ranch is characterized by Apache Leap tuff bedrock outcrops, a surface area covered with cobbles and boulders, approximately 6 to 18 inches to lithic bedrock (Soil Survey 2020). The soils are predominantly comprised of Woodcutter complex derived from weathered tuff and a parent material consisting of loamy and gravelly alluvium, with 15 to 50 percent slopes (Soil Survey 2020, accessed 12/21/2020). Elevation at the site ranges from 4,400 to 4,640 feet AMSL, which lies within the elevational breadth preferred by AHC.

The JI Ranch is home to hundreds of naturally-occurring AHC (WestLand 2004b). In addition to the naturally-occurring population that was detected in previous WestLand surveys, Resolution began propagating AHC at JI Ranch in 2011 under a shade structure (WestLand 2014b). These propagated AHC were subsequently monitored and ultimately transplanted into natural habitat on the property in two cohorts: 364 propagated individuals were transplanted in 2016 (WestLand 2016c), and the remaining 280 individuals were transplanted into the same general area in 2020 (see **Section 4**).

4. METHODS

4.1. TRANSPLANT AND MONITORING METHODS

AHC are known to have high survivorship when transplanted during the spring or fall (Siegwarth 2014); therefore, WestLand biologists prioritized transplantation of AHC in the fall, during October and November. WestLand adapted AHC transplant methodology from AHC research conducted by the Arizona Department of Transportation (ADOT) and the Boyce Thompson Arboretum (BTA) (Siegwarth 2014), and this methodology is provided below.

Previous research has indicated that some desert species have exhibited higher rates of success after translocation if planted in the same orientation from which the plant originated (University of Arizona 2005). Thus, prior to translocation, AHC were marked using white correction liquid on a single spine of each individual to mark the south side of the cactus. Each individual cactus was also individually marked with a small metal vegetation tag engraved with a unique ID using a carbide etching pen. Vegetation tags were attached to cobble adjacent to cacti using 24-gauge steel wire. After marking, a subset of the JI Ranch transplants (n=96 out of 280 total cacti) were divided into four groups based on four pre-determined transplant methods (see **Section 4.2**). All AHC were watered prior to translocation.

At each transplant location, a hole was dug that matched the size of the cactus to be transplanted. Specifically, holes were dug deep enough to allow for a taproot (or primary root) to extend fully and wide enough to provide adequate spacing for lateral roots to extend outward from the base of the plant. Prior to planting, each AHC was extracted from the transplant pot and the soil around the roots was loosened to encourage outward root growth. During planting, the roots were covered by the original soil removed from the newly dug hole. The soil around the root structure was lightly compacted and built up slightly around the base of the plant to provide stability.

After transplantation, each transplant location was marked with both the internal GPS on tablets and on a Garmin™ handheld GPS units. Representative photographs of the plants top, side, and landscape setting were taken, and the current reproductive activity and the health of each cactus was characterized. Reproductive activity was measured as a cumulative count of all fruits, buds, fertilized and unfertilized flowers. When a reproductive structure contained flower petals sprouting from an immature fruit, one

reproductive structure was recorded. While the AHC were transplanted outside of the flowering and fruiting season, desiccated flowers and fruits from the 2020 flowering season were still present on many of the cacti, providing an estimate of reproductive activity (see **Section 5**).

Cactus health was characterized in several ways, including a count of the number of live stems, the size of the cactus, presence or absence of herbivory, and a categorical measures of plant health. All live stems were counted on each cactus, including cumulative count of all living main stems, secondary stems, and pups. Cactus size was determined by measuring the height and width of each cactus. The height of each cactus was measured as a straight-line, vertical measurement, from the base of the plant to the upper-most portion of the plant, excluding spines and reproductive structures.[2] The width of each cactus was measured as a straight line across the widest portion of the plant, excluding spines and reproductive structures.[3] All measurements were recorded to the nearest millimeter (mm). Lastly, plants were assigned to a categorical measure of plant health, using the following categories:

- **Good**. The plant is characterized predominantly by plump, green stems (i.e., less than 25% discoloration).
- **Fair**. The plant is characterized predominantly by shrinkage or discoloration (25 – 50% discoloration).
- **Poor**. The plant is characterized predominantly by necrosis (over 50% discoloration).

In addition to the AHC that were transplanted in 2020, all previously transplanted AHC from 2016 were visited to determine the current health status of each plant within the JI Ranch conservation parcel. While the populations transplanted in 2016 and in 2020 were transplanted at different times, they will be monitored as a single population during future survey efforts. All field data were collected using a *Survey123* survey datasheet within the ArcGIS platform on Samsung tablets. Data were subsequently backed up to the WestLand server. To maintain data integrity, AHC data that were found to be incorrect in later analysis were excluded from final counts.

4.2. TREATMENT METHODS

AHC is often associated with rocky substrates, low vegetative cover, and shade, yet it is unclear which type of transplant location is best for AHC based on variable survivorship of AHC across types of transplant microhabitats (Siegwarth 2014, WestLand 2016c; see **Section 2**). As such, WestLand planted a subset of AHC into each treatment and individually marked each cactus with an aluminum vegetation tag to track its growth and reproductive success to inform future transplant efforts. The four treatments included: 1) AHC transplants provided with added rocks with shade (**Photograph 1**), 2) AHC transplants provided with added

[2] Plant height was measured vertical to gravity for field measurement consistency. Because of the measurement technique, the recorded heights of AHC growing on slopes may be exaggerated in some cases.

[3] Plant width was measured horizontally for field measurement consistency. Because of the measurement technique, the recorded widths of AHC growing on slopes may be understated in some cases.

rocks but no shade (**Photograph 2**), 3) AHC transplants were not provided with rocks but were provided with shade from vegetation (**Photograph 3**), and 4) AHC transplants were not provided with either rocks or shade (**Photograph 4**). For the added rock treatment, WestLand biologists placed rocks adjacent to AHC. For the added shade treatment, AHC were placed adjacent to larger plants (usually *Q. turbinella* or *A. pungens*) or positioned at the base of some rocky feature within the natural landscape of the JI Ranch where they would receive protection from the sun.

5. RESULTS

WestLand biologists and Tribal Monitors[4] documented previously transplanted AHC from October 20 to 22 and transplanted an additional 280 AHC into suitable habitat at the JI Ranch November 9 to 12, amounting to approximately 20 total person-days of survey effort (**Table 1**).

Table 1. 2020 Arizona Hedgehog Cactus Transplant Effort

2020 Monitoring and Transplant Dates	Number of Staff	Number of Person-days[1]
October 20-22	4	6
November 9-12	4	14

[1] A person day is equal to approximately 8 hours of work effort by one person and includes mid-day vehicle and hiking travel time within the JI Ranch but does not include travel time to and from lodging in the morning and afternoon.

WestLand biologists evaluated the health and reproductive status of the previously transplanted cacti in 2016 and of the transplants conducted in 2020 (see **Table 2** for details regarding health and reproductive status of AHC at the JI Ranch). Of the 131 cacti transplanted in 2016, 7 percent were in **Poor** condition, 26 percent were in **Fair** condition, and 67 percent were in **Good** condition. Of the 280 AHC transplanted in 2020, 8 percent were in **Poor** condition, 50 percent were in **Fair** condition, and 41 percent were in **Good** condition. AHC planted in the experimental treatments were of comparable size, number of live stems, and health category (**Table 2**). Cacti transplanted in 2016 and 2020 were predominantly characterized as having one stem (n = 83 and n = 274 cacti, respectively), while cacti transplanted in 2016 were more likely to have more than one stem than cacti transplanted in 2020. Unsurprisingly, given that the transplants and reproductive status of the cacti were determined outside of the primary flowering season (i.e., in April and May), there were few flowers or buds detected, although some dried flowers and buds were identified on the 2020 transplants. This likely reflects that the 2020 cacti were housed under a shade structure until transplantation, while the 2016 transplants were more exposed to the elements. On average, the cacti transplanted in 2016 were larger than the cacti transplanted in 2020.

[4] The Tonto National Forest Tribal Monitor Program includes tribal cultural and biological specialists from represented tribal communities including the White Mountain Apache Tribe, Gila River Indian Community, Yavapai-Apache Nation, Hopi Tribe, Pueblo of Zuni, Ak-chin Indian Community, and Mescalero Apache Tribe. The monitors intensively survey alongside archaeologists and biologist from WestLand to identify places of cultural significance using Traditional Ecological Knowledge (TEK).

Table 2. Status of AHC Transplants at the JI Ranch[1]

Transplant Cohort	# of AHC	AHC Health			Number of Live Stems				Number of Flowers				Number of Buds		Average Height (mm)	Average Diameter (mm)
		Poor	Fair	Good	0	1	2	3+	0	1	2	3+	0	1		
2016 Transplanted AHC	131	9	34	88	0	83	31	16	130	1	0	0	130	0	136.9	91.6
2020 Transplanted AHC	280	22	141	116	3	274	2	1	224	47	7	2	274	4	126.8	88.5
No Treatment	184	22	109	52	181	2	1	0	143	35	5	1	180	2	127.3	68.9
Rocks + shade	24	0	7	17	0	24	0	0	23	1	0	0	24	0	123.33	66.58
Rocks + no shade	24	0	8	16	0	24	0	0	17	5	2	0	23	1	120.92	66.83
No rocks + shade	24	0	7	17	0	24	0	0	20	4	0	0	24	0	129.13	67.58
No rocks + no shade	24	0	10	14	0	24	0	0	21	2	0	1	23	1	130.75	66.54

[1] Numbers reflect status of transplanted AHC within the JI Ranch boundaries in 2020. AHC attribute totals may not reflect total subpopulation numbers due to data collection errors resulting in <NULL> values for certain attributes. All <NULL> values were excluded.

6. DISCUSSION

Resolution has proposed the conservation of roughly 100 acres of private lands at JI Ranch to support the recovery of AHC. To this end, AHC were propagated and transplanted in 2016 and in 2020 by WestLand. Previous transplant efforts indicated that it is unclear what type of microhabitat AHC prefer (i.e., the degree of shade and number of rocks present) (Siegwarth 2014). WestLand therefore placed AHC into experimental treatments and characterized current plant health and reproductive success to track the success of AHC in each treatment. These data will support and inform transplant efforts for AHC both within the JI Ranch and in other transplant programs.

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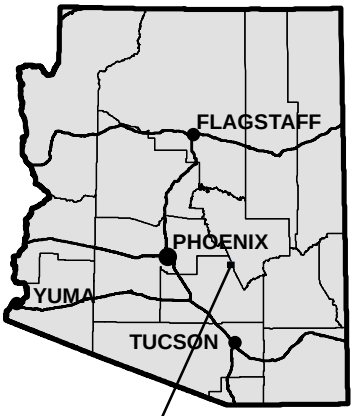
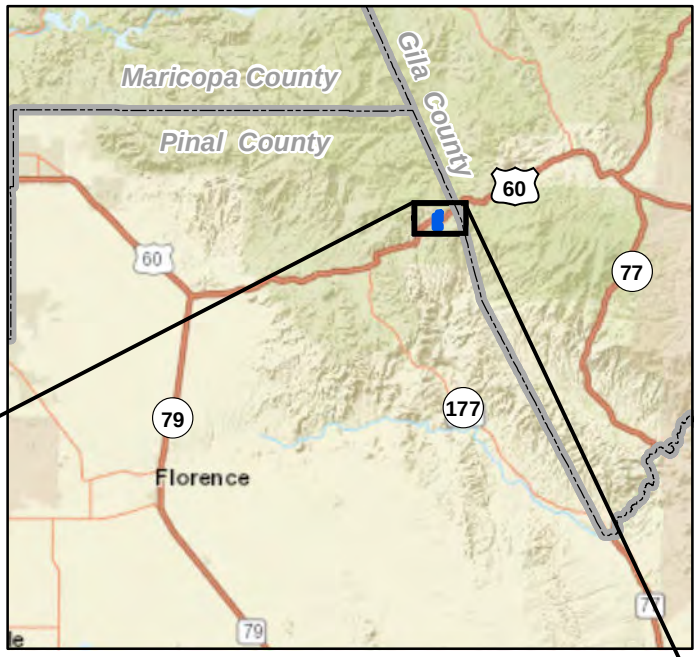
FIGURES

ARIZONA



PROJECT LOCATION

PROJECT VICINITY



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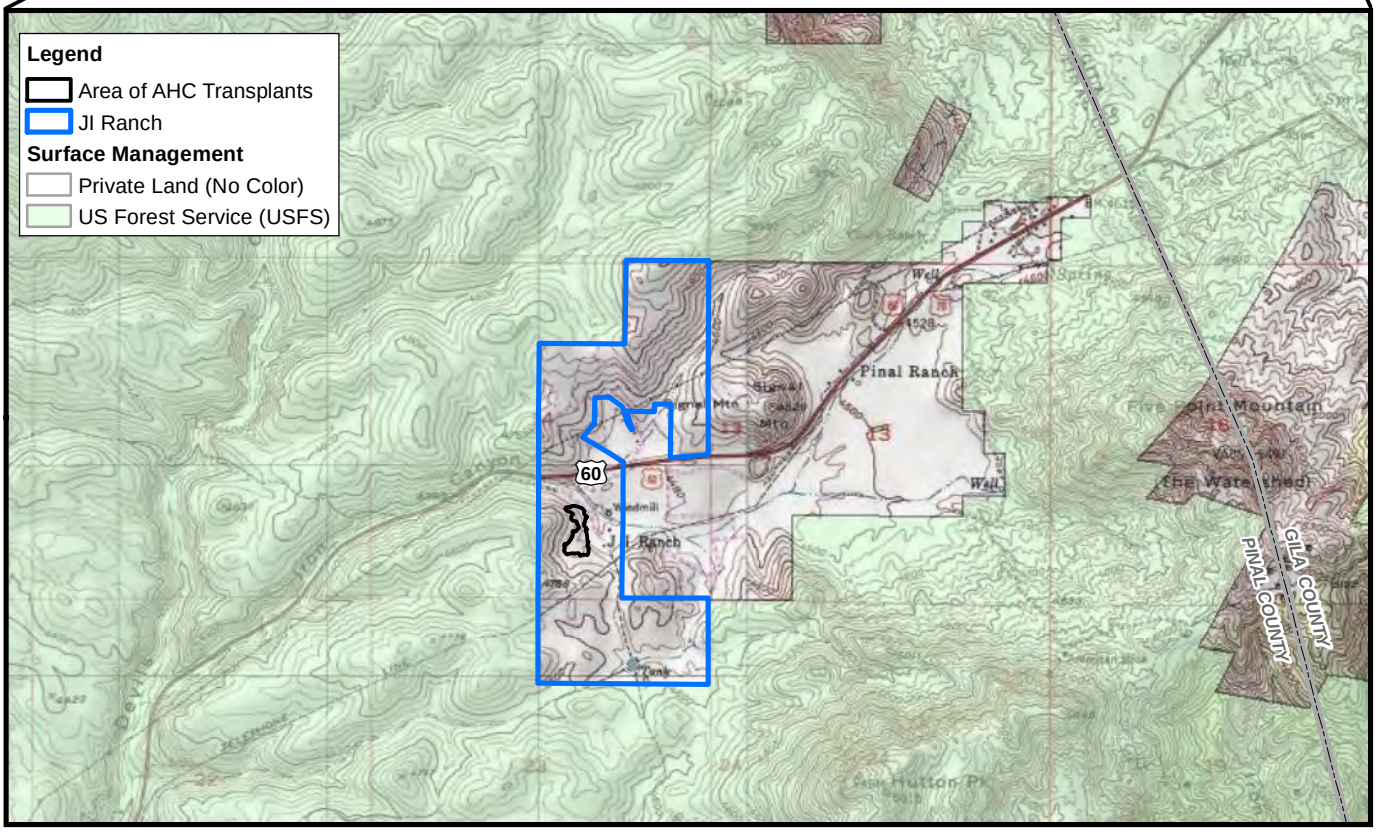


JI Ranch within:
T1S, R13E, Portions of Sections 14 and 23, Pinal County, Arizona
Superior 7.5' USGS Quadrangle.
Surface Management, BLM 2019, WRI Modified 2019
Image Source: ArcGIS Online World Street Map

WestLand Resources

N

0 1,500 3,000 Feet

0 500 1,000 Meters

RESOLUTION COPPER

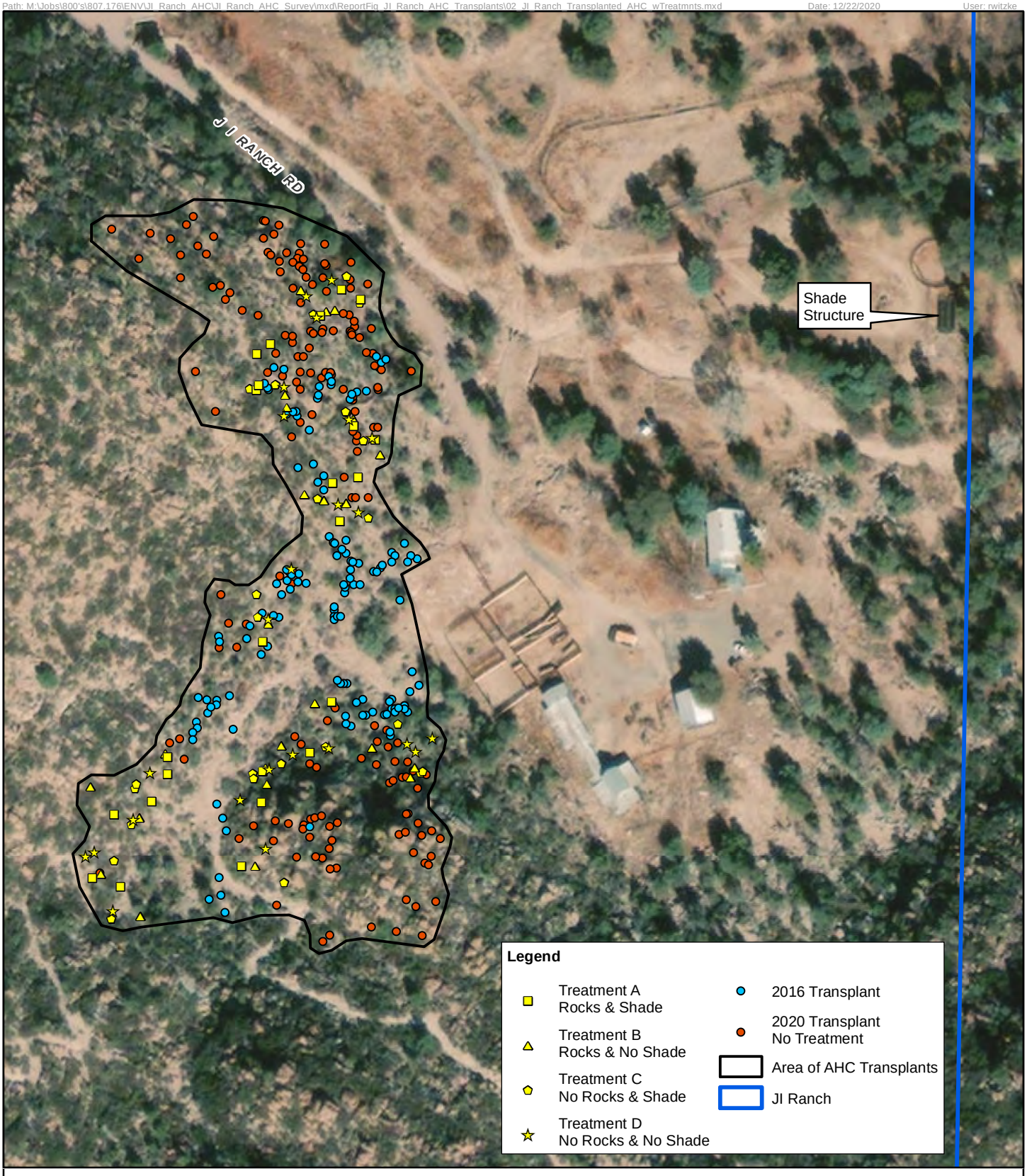
JI Ranch

Arizona Hedgehog Cactus Transplants

VICINITY MAP

Figure 1

Path: M:\Jobs\800's\807.176\ENV\JI_Ranch_AHC\JI_Ranch_AHC_Survey\mxd\ReportFig_JI_Ranch_AHC_Transplants\02_JI_Ranch_Transplanted_AHC_wTreatmnts.mxd Date: 12/22/2020 User: rwitzke



JI Ranch Transplants within:
T1S, R13E, Portion of Section 14,
Pinal County, Arizona
Image Source: ArcGIS Online World Imagery 2-6-2018

WestLand Resources

N

0 70 140 Feet

0 25 50 Meters

RESOLUTION COPPER

JI Ranch
Arizona Hedgehog Cactus Transplants

JI RANCH TRANSPLANTED AHC
WITH ADDED TREATMENT
TRANSPLANT LOCATIONS

Figure 2

APPENDIX B
Representative Photographs

Photo 1. An AHC located at the East Plant Site. None of the AHC sampled in the Resolution Project Area exhibited fire damage.

Photo 2. An AHC located at the East Plant Site. None of the AHC sampled in the Resolution Project Area exhibited fire damage.

Photo 3. An AHC located in the 230kV Powerline Corridor. None of the AHC sampled in the Resolution Project Area exhibited fire damage.

Photo 4. An AHC located in the 230kV Powerline Corridor. None of the AHC sampled in the Resolution Project Area exhibited fire damage.

Photo 5. U.S. 60 is visible in the background. The Telegraph Fire was restricted largely to areas south of U.S. 60 (pictured at left).

Photo 6. U.S. 60 is visible in the background. The Telegraph Fire was restricted largely to areas south of U.S. 60 (pictured in foreground).

Photo 7. Overview of JI Ranch south of U.S. 60.

Photo 8. A portion of JI Ranch within the Telegraph Fire burn perimeter.

Photo 9. A portion of JI Ranch south of U.S. 60, outside the Telegraph Fire burn perimeter.

Photo 10. An AHC within the JI Ranch burn perimeter. The AHC is pictured at bottom center.

Photo 11. An AHC within the burn perimeter at JI Ranch. Plant Health and Fire Damage were assessed as Good and 0%, respectively.

Photo 12. An AHC within the burn perimeter at JI Ranch. Plant Health and Fire Damage were assessed as Fair and 40%, respectively.

Photo 13. An AHC within the burn perimeter at JI Ranch. Plant Health and Fire Damage were assessed as Poor and 80%, respectively.

Photo 14. A dead AHC within the burn perimeter at JI Ranch. Fire Damage was assessed as 100%.

Photo 16. TNF lands between JI Ranch and the Resolution Project Area, within the Telegraph Fire burn perimeter.

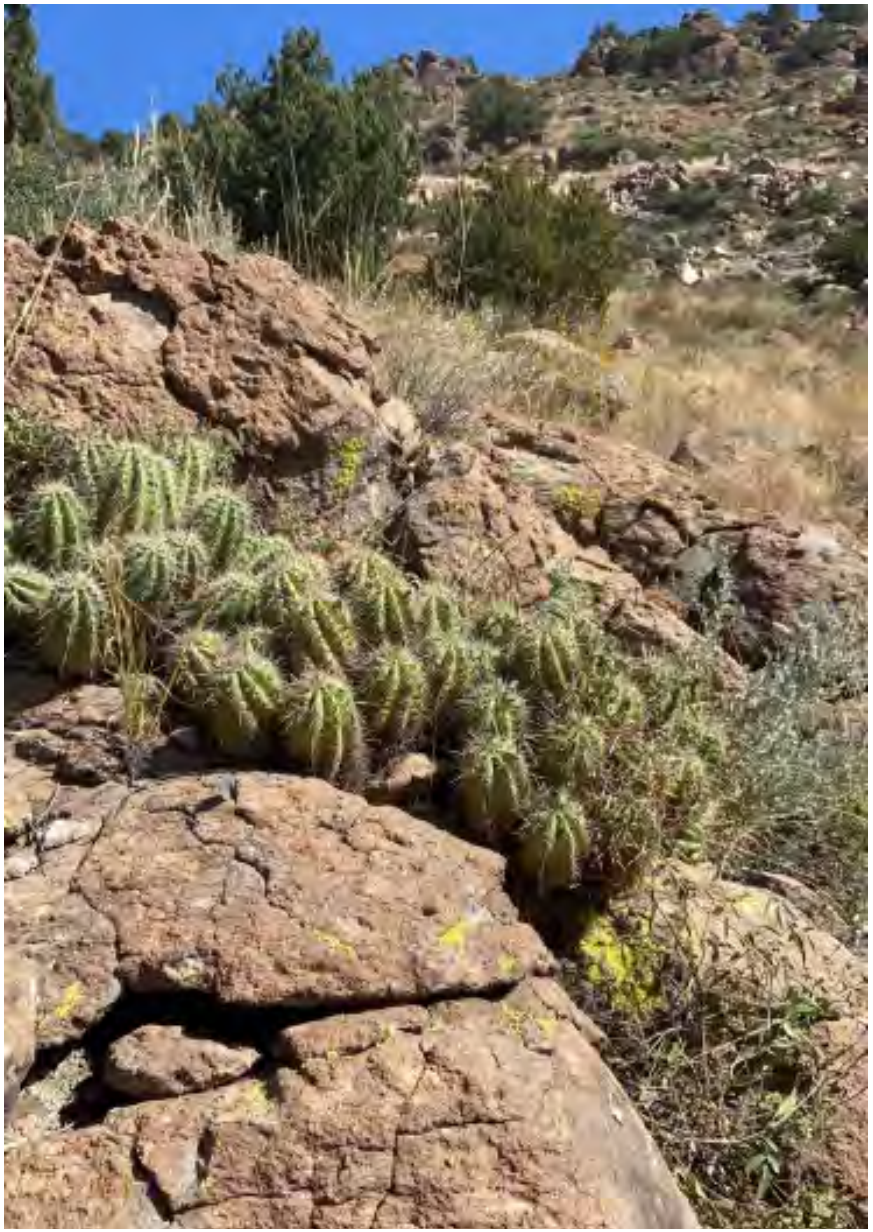


Photo 15. No evidence of fire damage was observed on JI Ranch north of U.S. 60.

APPENDIX B

Updated Official IPaC Species List

United States Department of the Interior

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

In Reply Refer To: 01/29/2025 16:50:53 UTC
Project Code: 2022-0047421
Project Name: Resolution Copper Mine-Skunk Camp

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

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

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

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

Sincerely,
/s/

Heather Whitlaw
Field Supervisor
Attachment

Attachment(s):

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

OFFICIAL SPECIES LIST

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

This species list is provided by:

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

PROJECT SUMMARY

Project Code: 2022-0047421
Project Name: Resolution Copper Mine-Skunk Camp
Project Type: Subsurface Extraction - Non Energy Materials
Project Description: Resolution Copper has submitted a Mining Plan of Operation to the Tonto National Forest (Tonto). The project is located on private, state, Forest Service lands in Pinal and Gila Counties. The National Environmental Policy Act (NEPA) process is in process and the Skunk Camp alternative has been selected as the proposed action. SWCA Environmental Consultants is assisting the Tonto with preparing the Biological Assessment for the project. This is an updated IPaC with a new shapefile for the previous submittal under Consultation Code 02EAAZ00-2020-SLI-0104 and Event Code 02EAAZ00-2020-E-00233.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.802416715955985,-110.68677931146993,14z

Counties: Gila and Pinal counties, Arizona

ENDANGERED SPECIES ACT SPECIES

There is a total of 15 threatened, endangered, or candidate species on this species list.

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

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

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

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

MAMMALS

NAME	STATUS
Mexican Wolf *Canis lupus baileyi* Population: U.S.A. (portions of AZ and NM)see 17.84(k) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3916	Experimental Population, Non-Essential
Ocelot *Leopardus (=Felis) pardalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4474	Endangered
Sonoran Pronghorn *Antilocapra americana sonoriensis* Population: U.S.A. (AZ), Mexico No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4750	Experimental Population, Non-Essential

BIRDS

NAME	STATUS
Cactus Ferruginous Pygmy-owl *Glaucidium brasilianum cactorum* There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1225	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

REPTILES

NAME	STATUS
Northern Mexican Gartersnake *Thamnophis eques megalops* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7655	Threatened

FISHES

NAME	STATUS
Gila Chub *Gila intermedia* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/51	Endangered
Gila Topminnow (incl. Yaqui) *Poeciliopsis occidentalis* No critical habitat has been designated for this species.	Endangered

NAME	STATUS
Species profile: https://ecos.fws.gov/ecp/species/1116	
Loach Minnow *Tiaroga cobitis* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6922	Endangered
Spikedace *Meda fulgida* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6493	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Acuña Cactus *Echinomastus erectocentrus var. acunensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5785	Endangered
Arizona Hedgehog Cactus *Echinocereus arizonicus ssp. arizonicus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1702	Endangered
Huachuca Water-umbel *Lilaeopsis schaffneriana var. recurva* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1201	Endangered

CRITICAL HABITATS

There are 5 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Gila Chub *Gila intermedia* https://ecos.fws.gov/ecp/species/51#crithab	Final
Loach Minnow *Tiaroga cobitis* https://ecos.fws.gov/ecp/species/6922#crithab	Final
Southwestern Willow Flycatcher *Empidonax traillii extimus* https://ecos.fws.gov/ecp/species/6749#crithab	Final
Spikedace *Meda fulgida* https://ecos.fws.gov/ecp/species/6493#crithab	Final

NAME	STATUS
Yellow-billed Cuckoo *Coccyzus americanus* https://ecos.fws.gov/ecp/species/3911#crithab	Final

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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

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

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

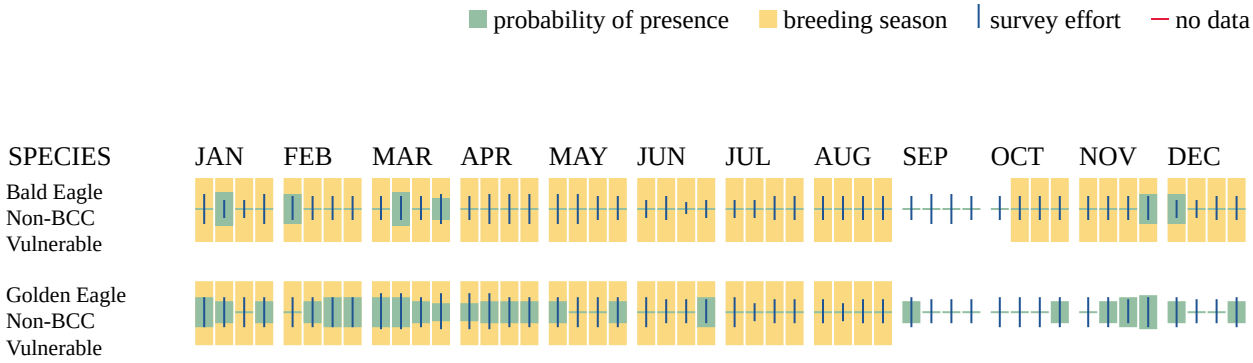
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

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

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Avocet *Recurvirostra americana* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11927	Breeds Apr 21 to Aug 10
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Bendire's Thrasher *Toxostoma bendirei* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9435	Breeds Mar 15 to Jul 31
Black-chinned Sparrow *Spizella atrogularis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9447	Breeds Apr 15 to Jul 31
Black-throated Gray Warbler *Setophaga nigrescens* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9584	Breeds May 1 to Jul 20
Broad-tailed Hummingbird *Selasphorus platycercus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11935	Breeds May 25 to Aug 21
Costa's Hummingbird *Calypte costae* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9470	Breeds Jan 15 to Jun 10
Gila Woodpecker *Melanerpes uropygialis* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5960	Breeds Apr 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Grace's Warbler *Setophaga graciae* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9514	Breeds May 20 to Jul 20

NAME	BREEDING SEASON
Lawrence's Goldfinch *Spinus lawrencei* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Lewis's Woodpecker *Melanerpes lewis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Phainopepla *Phainopepla nitens lepida* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11973	Breeds Mar 1 to Aug 20
Plumbeous Vireo *Vireo plumbeus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11933	Breeds May 10 to Aug 5
Red-faced Warbler *Cardellina rubrifrons* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9578	Breeds May 10 to Jul 15
Scott's Oriole *Icterus parisorum* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11968	Breeds May 21 to Aug 15
Varied Bunting *Passerina versicolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9725	Breeds Apr 25 to Sep 30
Virginia's Warbler *Leiothlypis virginiae* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Western Grebe *aechmophorus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31

NAME	BREEDING SEASON
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds elsewhere

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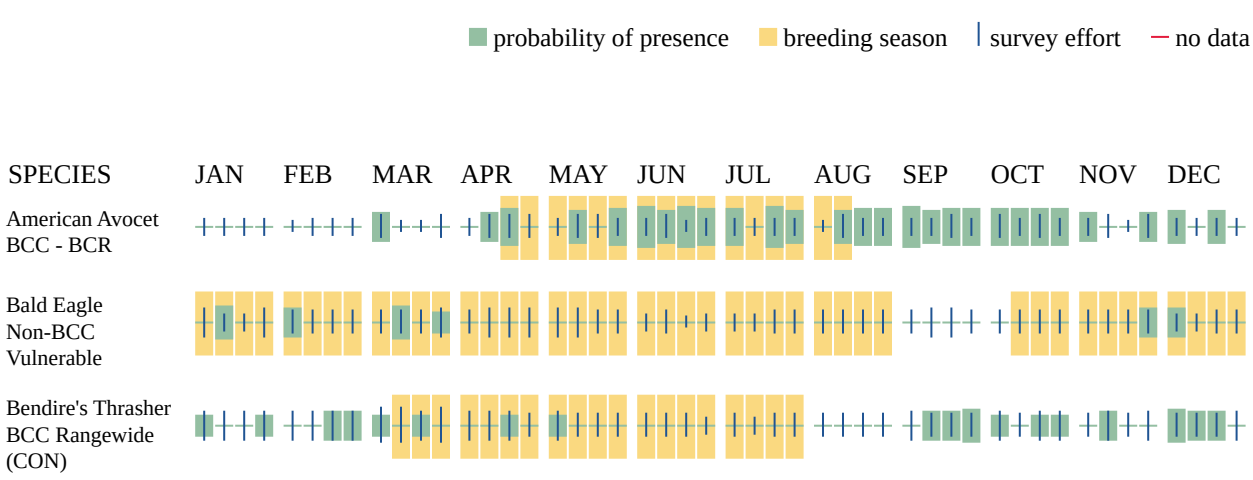

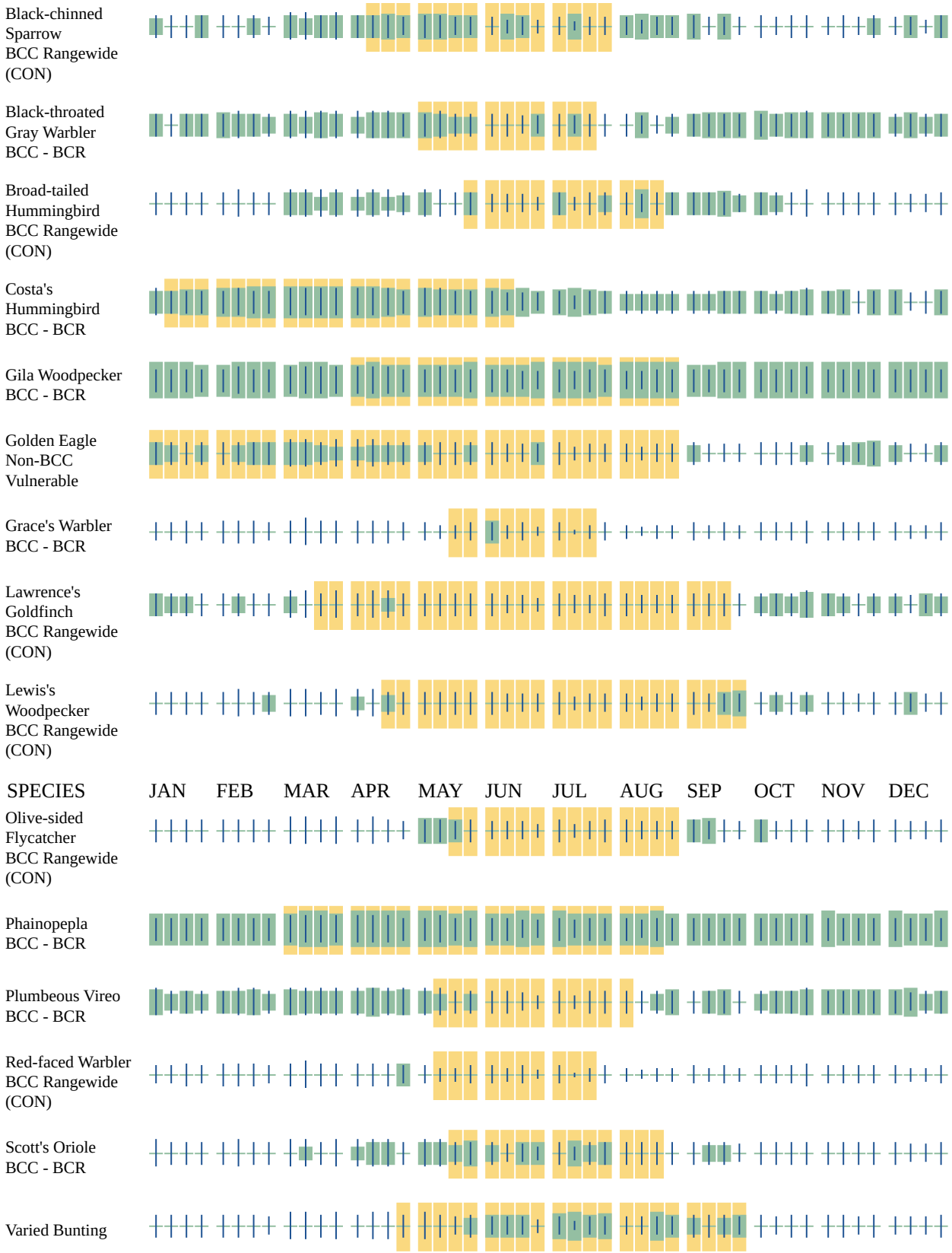
Black-chinned Sparrow BCC Rangewide (CON)
Black-throated Gray Warbler BCC - BCR
Broad-tailed Hummingbird BCC Rangewide (CON)
Costa's Hummingbird BCC - BCR
Gila Woodpecker BCC - BCR
Golden Eagle Non-BCC Vulnerable
Grace's Warbler BCC - BCR
Lawrence's Goldfinch BCC Rangewide (CON)
Lewis's Woodpecker BCC Rangewide (CON)
SPECIES
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Olive-sided Flycatcher BCC Rangewide (CON)
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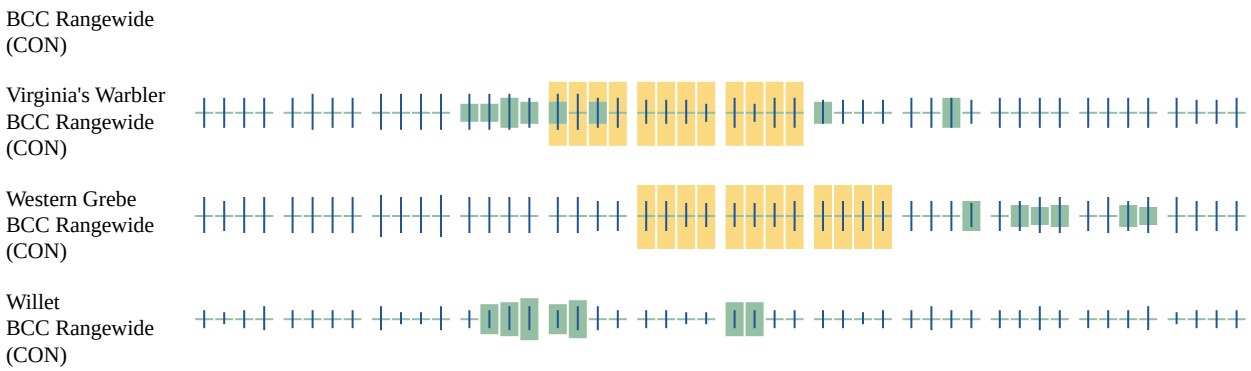

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WETLANDS

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

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

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

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPAC USER CONTACT INFORMATION

Agency: Forest Service
Name: Eleanor Gladding
Address: 343 W Franklin St
City: Tucson
State: AZ
Zip: 85701
Email egladding@swca.com
Phone: 5203259194