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In Reply Refer To:  
AESO/SE  
02EAAZ00-2012-F-0334

June 9, 2014

Ms. Karla S. Petty, Division Administrator  
Arizona Division  
Federal Highway Administration  
4000 North Central Avenue, Suite 1500  
Phoenix, Arizona 85012-3500

RE: Biological Opinion for the Oak Flat-Miami US 60 Roadway Enhancement Project  
(Federal Project No. STP-HSIP 060-D[211]T) (TRACS No. 060 PN 229 H5818 01C)

Dear Ms. Petty:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544), as amended (Act). Your request was dated February 4, 2014, and received by us on the same day. At issue are impacts that may result from the proposed roadway enhancements along U.S. Highway 60 (US 60) between the towns of Superior and Miami in Pinal and Gila counties, Arizona.

Your letter concluded that the proposed action may affect, and is likely to adversely affect the endangered *Echinocereus triglochidiatus* var. *arizonicus* (Arizona hedgehog cactus), herein referred to as the Arizona hedgehog cactus. Your letter also requested our concurrence with your determination that the proposed action may affect, but is not likely to adversely affect the endangered ocelot (*Leopardus pardalis*). We concur with your determination for the ocelot and have provided our rationale in Appendix A.

This biological opinion is based on information provided in the (1) January 24, 2014, *Arizona Department of Transportation Biological Evaluation* (BE), (2) May 7, 2014, *Arizona Department of Transportation Arizona Hedgehog Cactus Survey Report Memorandum*, (3) November 2, 2012, *Arizona Department of Transportation Arizona Hedgehog Cactus Survey Report Memorandum*, (4) August 2013, Arizona hedgehog cactus locations in the project limit provided by Logan Simpson Design, Inc., (5) meetings between my staff and the Arizona Department of Transportation, (6) telephone conversations, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern and its effects, or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

## **Consultation History**

- August 14, 2012: We received preliminary survey results of the Arizona hedgehog cactus for the geotechnical investigation that would inform the US 60 Passing Lane Project designs.
- August 23, 2012: We received the Memorandum, *Geotechnical Investigation and Arizona Hedgehog Cactus Survey Results* from Logan Simpson Design, Inc.
- August 28, 2012: We agreed with your “no effect” determination on the Arizona hedgehog cactus for the geotechnical investigations associated with the US 60 Passing Lane Project.
- September, 17, 2013: We hosted a meeting with staff from the Arizona Department of Transportation and Logan Simpson Design, Inc. to discuss the US 60 Passing Lane Project, possible future re-route of US 60, Arizona hedgehog cactus survey results, and possible mitigation for the species.
- February 4, 2014: We received the Arizona Department of Transportation’s Biological Evaluation and request for formal consultation for Oak Flat to Miami, US 60 roadway enhancement project (060 PN 229 H5818 01C).
- February 26, 2014: We met with staff from the Arizona Department of Transportation, Logan Simpson Design, Inc., Desert Botanical Gardens, and Boyce Thompson Arboretum to discuss scope of work, salvage of Arizona hedgehog cacti, and mitigation plans for the cactus.
- February 28, 2014: We transmitted a thirty-day letter initiating formal consultation.
- May 28, 2014: We transmitted a draft biological opinion for review.
- June 3, 2014: We received your comments on the draft biological opinion.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

The Arizona Department of Transportation (ADOT), with funding provided by the Federal Highway Administration (FHWA), is proposing to conduct several roadway improvements along US 60 between the towns of Superior and Miami. The overall project will consist of four individual sub-projects that are planned at discrete locations along the highway, in addition to staging areas and disposal areas for depositing cut and fill material (Figure 1). The four sub-projects include Waterfall Canyon Bridge improvements, shoulder widening, and constructing passing lanes between milepost (MP) 229.48 to MP 242.42.

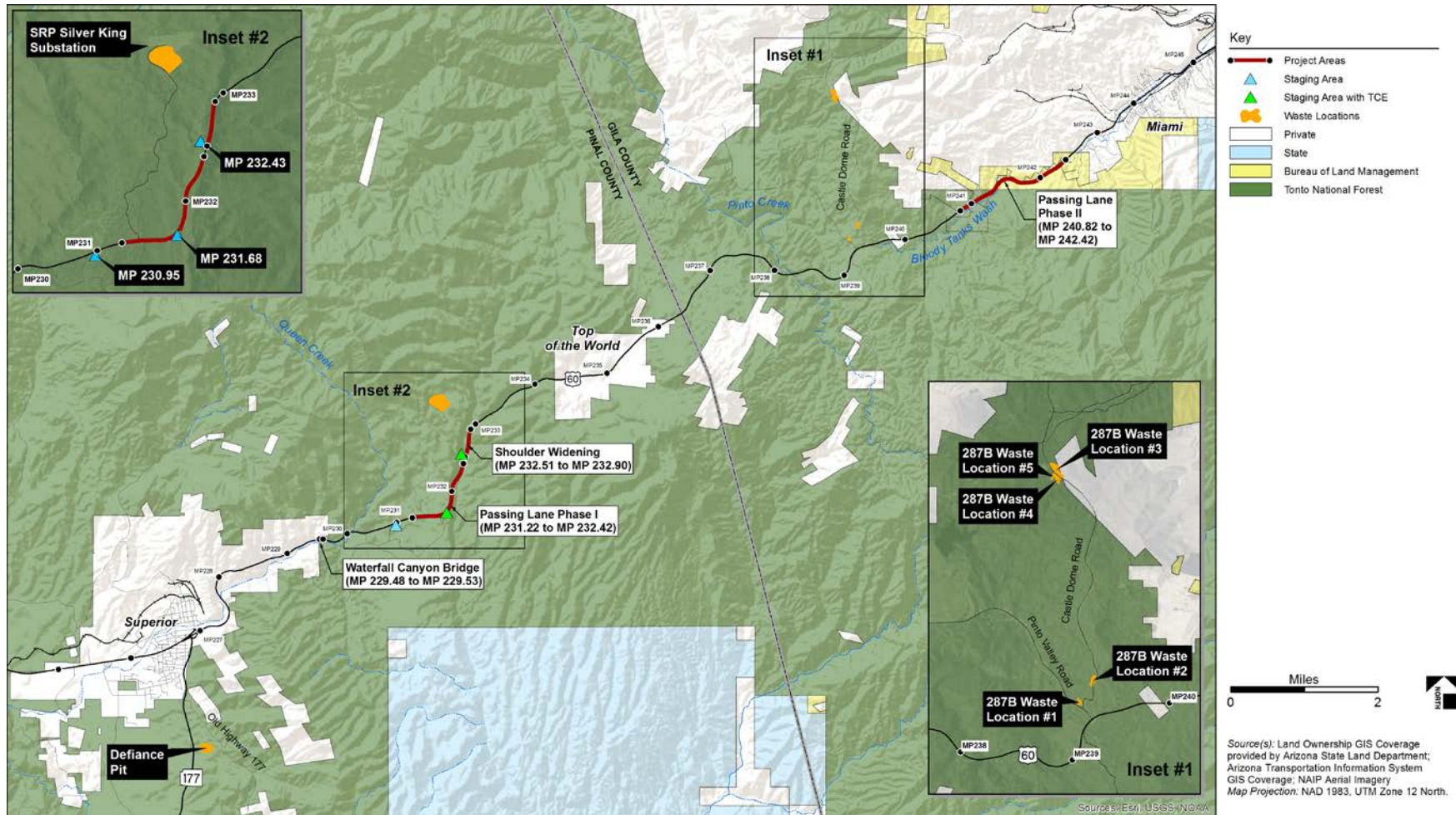


Figure 1. Map of the entire project area by landowner showing locations of the construction areas, staging/stockpiling areas, and seven waste disposal areas. Note: the 287B Waste Location 4 and 287B Waste Location 5 have been removed from the final project implementation.

All of the project's construction activities will occur within ADOT's right-of-way/easement through the Tonto National Forest (Forest), Bureau of Land Management (BLM) lands, and private lands.

***Waterfall Canyon Bridge*** (MP 229.48 to MP 229.53) – includes the installation of scour protection along the bridge abutments and the repair of concrete columns and areas of voided material between the columns. No vehicular access under the bridge is required to make the planned repairs, because the work can be accomplished by hand without heavy equipment. No ground disturbance will occur.

***Phase I Passing Lane*** (MP 231.22 to MP 232.42) – includes widening the roadway to the south along the eastbound travel lane with the addition of a 12-foot-wide passing lane with a 6-foot wide shoulder to the westbound travel lane. Additionally, the project includes relocating existing utilities to accommodate the wider roadway, extending the drainage culverts, installing guardrails, construction of retaining walls, pavement preservation (mill and replace of ½-inch on the travel lanes), and other related items associated with the addition of the passing lane. Blasting is required in some areas on the eastbound side of US 60 to accommodate the wider roadway. Access routes outside the clearing limits are not typically built to gain access to a blasting location; it is expected that the equipment will pioneer access within the clearing limits to the blasting locations. Total disturbance associated with Phase I will be 5.24 acres of temporary disturbance and 2.16 acres of permanent disturbance (Table 1).

***Shoulder Widening*** (MP 232.51 to MP 232.90) – includes the widening of the paved shoulders to 6 feet, adding a cut ditch, installing grooved rumble strips, reconstructing the guardrail, pavement preservation activities (overlay ½-inch on the full roadway width), and extending one culvert to accommodate the wider shoulders. Blasting will be required in some areas on the eastbound and westbound sides of US 60 to accommodate the wider roadway. Total disturbance associated with shoulder widening will be 3.19 acres of temporary disturbance and 0.37 acres of permanent disturbance (Table 1).

Blasting in the Phase I Passing Lane and Shoulder Widening projects will occur during daylight hours and is expected to occur at a frequency of every other day (an average of three blasts per week) while blasting activities are ongoing in each project area. In the Phase I Passing Lane project area, blasting is anticipated for a total of 11.5 days over a four week period. In the Shoulder Widening project area, blasting is anticipated to occur for a total of 12 days over a four week period.

***Phase II Passing Lane*** (MP 240.82 to MP 242.42) – includes widening the roadway on both sides to add a 12-foot-wide passing lane with a 6-foot shoulder to the westbound travel lane. Additionally, the project would include the relocation of existing utilities to accommodate the wider roadway; extension of drainage culverts; installation of guardrail; construction of retaining walls, concrete barriers, and other related items associated with the addition of the passing lane; and pavement preservation activities (overlay ½-inch on the travel lanes). Blasting would be required in some areas to accommodate the wider roadway for a total of 44 days over a 15 week period. Total disturbance associated with Phase II would be 5.32 acres of temporary disturbance and 1.98 acres of permanent disturbance (Table 1).

Please note, during the completion of this biological opinion, changes were made to the timing of work in Phase II. ADOT plans to complete box culvert extensions at the same time as the other sub-projects. The addition of passing lanes would begin at a later date with the work dependent on available funds.

In addition, the four sub- projects will require clearing and grubbing of existing vegetation, excavation of cut slopes adjacent to the existing roadway, and the placement of fill material on steep slopes to allow for the construction of new passing lanes. Earthwork will be accomplished using a combination of heavy equipment such as cranes, excavators, loaders, dump trucks, bulldozers, and backhoes. Some of the material that is removed during construction activities will be used for the new roadway. The remaining material will be deposited at potentially five waste disposal areas located on the Forest (Table 1). There will be three staging and stockpile areas used within ADOT's right-of-way/easement at MP 230.65, MP 231.68, and MP 232.43 to house equipment and machinery (Figure 1). The Phase I Passing Lane project will also require temporary construction easements at two staging areas and approximately 1.4 acres of new right-of-way/easement from the Forest where cut/fill slopes and associated earthwork would extend outside of ADOT's existing right-of-way.

**Table 1. The seven potential waste areas for material disposal, their total size, and location on the Tonto National Forest.**

Waste Area	Size (acres)	Location (Township/Range/Section)
SRP Silver King Substation	9.8	T1S/R13E/Sections 15, 16, 21, and 22
287B Waste Location #1	0.73	T1S/R14E/Section 4
287B Waste Location #2	1.44	T1S/R14E/Section 4
287B Waste Location #3	3.38	T1S/R14E/Sections 28 and 29
Defiance Pit	9.51	T2S/R12E/Section 11

Construction activities will occur during daylight hours and will result in approximately 13.75 acres of temporary disturbance and an additional 4.51 acres of permanent conversion of land to build structures and pavement (Table 2). All disturbed ground that will not be landscaped or otherwise permanently stabilized by construction, including edge-of-pavement buildup, will be reseeded with a native seed mix and allowed to revegetate following project completion. Routine maintenance of the project areas would include weed control and removal of woody vegetation next to the paved edge along US 60.

**Table 2. Acreages of temporary disturbance and permanent loss by project area.**

<b>Project Name</b>	<b>Temporary Disturbance*</b>	<b>Permanent Loss*</b>	<b>Total Disturbance</b>
Waterfall Canyon Bridge	0	0	0
Phase I Passing Lane	5.24	2.16	7.4
Shoulder Widening	3.19	0.37	3.56
Phase II Passing Lane	5.32	1.98	7.3
<b>Totals</b>	<b>13.75</b>	<b>4.51</b>	<b>18.26</b>

**Note:** Temporary disturbance refers to the potential for revegetation in the area following construction. Permanent disturbance is the loss of land to pavement or other built structures.

Construction is expected to begin in summer 2014 and be completed within 220 days. The exception to this is the addition of passing lanes in the Phase II Passing Lane project which would begin at a later date and be dependent on available funding. Depending on the length of time before construction is scheduled to begin, the status of species within the Phase II Passing Lane project area would be updated 90 days prior to construction to update the status of any new species that may occur in the project area, if action agency effect determinations are appropriate, and ensure current conditions have not changed. If a substantial amount of time has passed (1 to 3 years) or design plans have significantly changed, the environmental clearance will be updated/re-evaluated prior and if warranted, coordinated with FWS.

### **Conservation Measures**

In order to minimize project-related impacts, several conservation measures will be implemented by ADOT, in conjunction with FHWA. These are briefly summarized below.

A Joint Project Agreement will be developed between ADOT and the Boyce Thompson Arboretum to facilitate the salvage and transplant of individual Arizona hedgehog cacti that will be affected by the proposed action. Prior to salvage, a comprehensive pre-construction survey was completed that documented locations of any Arizona hedgehog cactus within all areas requiring ground disturbance. Where possible, the Arizona hedgehog cactus will be protected in place by marking, flagging or fencing. The project construction limits will be clearly marked, fenced or flagged such that all debris would be contained within ADOT's right-of-way. All personnel who will be on-site will need to complete the provided environmental awareness training on the Arizona hedgehog cactus. A biological monitor will be present during initial phases of vegetation removal. The avoidance and salvage operations for the Arizona hedgehog cactus will be implemented prior to the initiation of construction.

General mitigation, not pertaining to the Arizona hedgehog cactus, will include but is not limited to: the development of a Noxious and Invasive Plant Species Treatment and Control Plan, avoidance measure for migratory birds, surveys for possible bats near Waterfall Canyon bridge, avoidance measure for the Sonoran desert tortoise, reseeding of all disturbed areas that will not be landscaped or otherwise stabilized by construction, and measures to prevent introduction of invasive plant species.

The following conservation measure will also be included pertaining to the ocelot:

- In order to reduce the risk of vehicle collisions with ocelots, ADOT will install “Watch for Animals” signs within the project area to alert drivers about animals potentially crossing the highway.

A complete list and description of the all mitigation measures can be found in the January 24, 2104, BE.

### **Action Area**

The action area is located in central Arizona between the towns of Superior and Miami. Highway US 60 is a two-lane highway with two 11 to 12-foot wide travel lanes with varying 2 to 12-foot wide shoulders. The posted speed limit within the sub-project areas is 55 miles per hour (MPH). The waste locations, with the exception of the Salt River Project (SRP) Silver Substation, are located next to access roads in areas that have been previously disturbed with little to no vegetation. Staging areas located at MP 230.95 and 231.68 are next to US 60 and are currently used for vehicle pull-outs. The staging area at MP 232.43 is located next to US 60 within an old Forest campsite containing riparian vegetation that is encircled by remnants of a primitive road. The SRP Silver King substation waste area is located along the access road in an undisturbed, naturally vegetated area.

The topography in the action area is rugged, with steep, near-vertical cliff faces bordering US 60 in various locations. The elevation in the Waterfall Canyon Bridge, Phase I Passing Lane, and Shoulder Widening project range from approximately 3,700 to 4,200 feet above mean sea level (increasing from west to east); and from approximately 3,500 to 3,900 feet in the Phase II Passing Lane project area (decreasing from west to east) (ADOT 2014a). There are several ephemeral drainages in the project area including Waterfall Canyon, Queen Creek Canyon, Devils Canyon, and Bloody Tanks Wash. US 60 traverses through (and crosses) Devils Canyon at the east end of the Phase I Passing Lane project area, and Bloody Tanks Wash is crossed over several times by US 60 in the Phase II Passing Lane project area.

The vegetation is typical of upper central Arizona, which includes interior chaparral, mixed oak, and juniper communities (Pase and Brown 1994). A small portion of vegetation within the Phase II project area is within the Madrean evergreen woodlands type which then transitions to semi-desert grassland community (Brown 1994). Some of the dominant vegetation types includes: Emory oak (*Quercus emoryi*), juniper (*Juniperus* sp.), manzanita (*Arctostaphylos* spp.), shrub live oak (*Quercus turbinella*), wait-a-minute bush (*Mimosa biuncifera*), catclaw acacia (*Acacia greggii*), jojoba (*Simmondsia chinensis*), brittlebush (*Encelia farinosa*), and desert broom (*Baccharis sarothroides*). Other species observed in these project areas include golden-flowered agave (*Agave chrysantha*), banana yucca (*Yucca baccata*), beargrass (*Nolina microcarpa*), and desert spoon (*Dasyilirion wheeleri*). Vegetation in the Phase II Passing Lane project area includes species such as Emory oak, velvet mesquite (*Prosopis velutina*), acacia, manzanita, shrub live oak, desert spoon, and mountain mahogany (*Cercocarpus betuloides*) (ADOT 2014a).

## STATUS OF THE SPECIES

The Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*) was listed as endangered without critical habitat on October 25, 1979 (44 FR 61556). There is no final recovery plan for the cactus but a draft recovery plan was developed in 2013 and is currently in progress. In 1984, Region 3 of the Forest Service drafted a technical review of the Arizona hedgehog cactus but the document was never finalized and is not an officially approved recovery plan by the FWS. The purpose of the technical review was to propose reasonable actions that the Forest Service deemed necessary for the recovery of the species. The status of these proposed implementation steps for recovery is unknown. The cactus is also protected by the Arizona Native Plant Law (A.R.S. Chapter 7, Article 1) (AZDA 2013) as a Highly Safeguarded Native Plant and is protected from international trade by the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The Arizona hedgehog cactus is a succulent perennial with dark green cylindroid stems that grows in loose clumps of four to 20 stems (Arizona Rare Plant Committee 2001). Occasionally a plant will have over 50 stems. Large, robust stems arise from the base of the plant, growing up to 16 inches in length and up to 4 inches in width (Arizona Rare Plant Committee 2001). Each stem has eight to 13 tuberculate ribs, with nine the most common; ribbing strong. Spines are smooth and short, consisting of five to 11 radial spines per areole (Arizona Rare Plant Committee 2001) but fewer than nine is commonly observed (Baker 2006). There are one to four gray or pinkish central spines that are less than 1.9 inches long, terete (smooth, cylindrical and tapering) (Zimmerman and Parfitt 2003) with the largest deflexed or bending downwards (AGFD 2003). Flowers erupt along the sides of the stem near the upper third of stem ribs, and are a brilliant scarlet to deep red color. The flower is stout, erect, about 2 inches in diameter and 3 inches in length (AGFD 2003) appearing in late April to mid-May. The fruit is large (0.79 to 1.18 inches long), green with brownish tinge in color. Fruiting occurs from May to June with germination occurring in midsummer (Arizona Rare Plant Committee 2001). Mature cacti can produce many fruits per year with each fruit producing up to 100 seeds (AGFD 2003). Morphological investigations by Baker (2006) recommends that this taxon be placed within *Echinocereus arizonicus* (*E. arizonicus* ssp. *arizonicus*), instead of within section *Triglochidiatus*. The Flora of North America also refers to the variety as a subspecies of *Echinocereus arizonicus* (Zimmerman and Parfitt 2003). We recognize that revising the taxonomy of the cactus should be addressed. Until that time we continue to refer to the cactus as *Echinocereus triglochidiatus* var. *arizonicus*.

The Arizona hedgehog cactus occupies a narrow geographic range between the towns of Superior and Globe in Pinal and Gila counties of central Arizona. Its known range extends from Superstition Wilderness area south to Devils Canyon, east along US 60 to Top of the World and south to the Mescal and Pinal Mountains (Baker 2013; Arizona Rare Plant Committee 2001). The range includes two small subpopulations, the Apache Peak subpopulation north of the city of Globe and the El Capitan subpopulation south of Globe. Other varieties of red claret-cup cacti, particularly *Echinocereus santaritensis*, occur along the periphery or are intermingled with Arizona hedgehog cactus populations at the edge of its distribution. These other varieties have similar appearances and have been mistaken for Arizona hedgehog cactus. However, plants within the type locality for the Arizona hedgehog cactus are “classical var. *arizonicus*” and are the only populations subject to the protection and restrictions of the Act.



Arizona hedgehog cactus is found at elevations ranging from 3,300 to 5,700 feet within the ecotone between Madrean Evergreen Woodland and Interior Chaparral. Preferred Arizona hedgehog cactus habitat is exposed and stable bedrock and boulders exhibiting sufficient fracturing or rock interstices for establishment. Parent rock materials of preferred habitat are Schultze granite and Apache Leap tuff (dacite), both igneous in origin (AGFD 2003; USFS 1996). Pinal schist and the Pioneer formation in proximity to the dacite and Schultze granite also provide habitat for the cactus, but only where these formations express themselves as exposed bedrock (USFS 1996). The majority of Arizona hedgehog cacti are found scattered on open, rocky slopes of 20 to 90 degrees, and steep, fissured cliffs (Philips et al. 1979; USFS 1996). Its roots invade cracks, fissures, or interstices within exposed rock or narrow pockets between boulders where the microclimate provides the necessary periodic moisture, moist soils, and shelter from high temperatures (USFS 1996). The cactus may be found on flatter ground and more open slopes as well as in the understory of shrubs, but moderate to high shrub densities and associated deeper soils tend to preclude the cactus (USFS 1996). Ninety percent of occupied Arizona hedgehog cactus is on the Globe Ranger District of the Tonto National Forest. Remaining occupied habitat occurs on land managed by the BLM, Arizona State Land Department, or is privately owned.

Abundance count information for the species is limited. Direct access to a large portion of the species range is very limited due to the rugged topography and remoteness of its habitat making surveys difficult to conduct. In addition, this variety can be difficult to distinguish from other varieties such as *Echinocereus santaritensis*. Most of the count information has been reported by Federal agencies for their projects in Arizona hedgehog cactus habitat requiring section 7 consultations.

According to the Arizona Heritage Management Database (HDMS), approximately 1,302 cacti were observed between 1922 and 2009 on the Tonto National Forest (S. Schwartz, AGFD, pers. comm. 2009). Some of those records are anecdotal and, for older records, the genetics of the individual are uncertain and need to be verified for the variety *arizonicus*. WestLand Resources, Inc. (2013), conducted surveys of the Arizona hedgehog cactus between 2010 and 2012, in conjunction with the prefeasibility study for the proposed Resolution Copper mine. Surveys took place in and around the type locality of Arizona hedgehog cactus, between Globe and Superior, and in adjacent mountain ranges and canyons. This effort located 4,035 individuals. For some of the records; however, WestLand Resources, Inc. noted that genetic analysis has not been performed on any of those cacti to date and genetic variation within the individuals is unknown. Later work by Baker (2013) identified some of those Arizona hedgehog cactus observed by WestLand, Inc. and some plants included in HDMS were of *Echinocereus santaritensis*. In 2013, using grant funding, additional areas within suitable Arizona hedgehog cactus habitat were surveyed. The results of this effort were compiled with all survey data collected up until 2013. In total, approximately 6,010 plants have been located and this number represents the best available scientific data on abundance counts. Baker (2013) believes that more suitable habitat exists that supports additional plants, but that additional surveys within its range are needed. Trend information characterizing the rangewide population is not available.

Threats to the Arizona hedgehog cactus are identified as habitat destruction by mining, mineral exploration, road construction, power-line construction and utility corridors, off-highway vehicle use and other recreational activities, rangeland improvements including water developments and trampling by livestock. Additional threats to the cactus include

illegal collecting, wildfire, herbicide and pesticide application, and insect infestation (Philips et al. 1979; AGFD 2003; USFS 1996).

As of 2013, thirteen formal section 7 consultations have been conducted for the species. Previous projects have resulted in the direct impact or loss of an estimated 3,247 individuals and impacts to approximately 919.41 acres of occupied and/or suitable habitat. In 1996, a Conservation Assessment and Plan was finalized for the Arizona hedgehog cactus on the Tonto National Forest. The main recommendation of the plan was the identification of “safe areas”, logical ecological units within the distributional limits of the taxon where the Federal government has options to maintain relatively strict control over land uses with management emphasis toward the perpetuation of the species (USFS 1996).

## **ENVIRONMENTAL BASELINE**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR § 402.02). We defined the action area as (1) the existing and new right-of-way bordering both sides of US 60 from MP 229.48 to MP 242.42; (2) areas delineated for each of the seven waste disposal areas; (3) the three staging areas; and (4) the area associated with the temporary construction easement. In total, the action area encompasses 155.22 acres.

#### **A. Status of the species within the action area**

The action area is located in the range of the Arizona hedgehog cactus, and US 60 runs through a dense portion of the population. In preparation for this project, ADOT conducted pedestrian surveys for the Arizona hedgehog cactus in 2012 (ADOT 2012). The surveyed area was within the ADOT easement beginning at MP 220.30 to MP 229.50 near the Waterfall Canyon Bridge, then from MP 230.17 to MP 232.3 at the end of Phase I, and from MP 240.77 to MP 242.53 in the Phase II project area. The survey width varied, extending 20 to 140 feet from the existing pavement, and the survey was conducted using parallel transects that were 20 feet wide plus visual scans of cliff walls in order to get full coverage of the area. ADOT had also obtained previously known locations of the cactus from the Forest and re-verified those locations during the survey. In total, 54.81 acres were surveyed with a total of 31 Arizona hedgehog cacti documented. All of the cacti were located in the Phase I Passing Lane project area or in adjacent habitat between MP 231.5 and MP 233.0. Plants were found scattered on steep slopes on both sides of US 60 from Waterfall Bridge to just beyond the Gila-Pinal county lines. No cacti were found in the Phase II Passing Lane project area.

In April 2014, ADOT arranged for qualified biologists to conduct 100% pre-construction surveys for the Arizona hedgehog cactus within the areas where ground disturbance for this

project is planned. The surveyed areas included those within the Phase I Passing Lanes and Shoulder Widening project areas, three staging/stockpiling areas at MP 230.95, MP 231.68, and MP 232.43, and the waste area at SRP's Silver King Substation (ADOT 2014b). No surveys were conducted in the Phase II Passing Lane project area based on 2012 findings of no available suitable habitat and no previous occurrence records of Arizona hedgehog cactus. The boundaries of the survey area along US 60 were based on the understanding that construction activities would occur within 10 feet of the roadway cut and fill lines. Pedestrian surveys were conducted using parallel transects that were 20 feet wide in order to achieve 100% coverage of the project area. A total of 24.28 acres were surveyed and a total of 49 Arizona hedgehog cacti were found. Five of these plants were located in the SRP Silver King waste disposal area. Most of the plants were mature adults and appeared healthy with some in bloom. Some plants had already flowered; no fruits were observed. No cacti were found in the three staging/stockpiling areas.

### **B. Factors affecting species environment within the action area**

There is little human activity in the action area. There are few places to pull off the highway and there is no existing trail to hike the area. The area is rugged and primarily appears undisturbed. Other than the existing roadway and its associated maintenance and/or improvement, the landscape within the action area has remained largely unaffected by the highway. Most highway-related activity is limited to the roadway and shoulder, and the ADOT easement on either side of the road maintains the integrity of the landscape. In addition, because of the absence of extensive access areas or pull-outs, steep terrain along US 60, and the general rocky landscape, the area is not typically sought out for purposes other than occasional recreational exploration. However, use of vehicles along the roadway can exacerbate the risk of wildfire in the action area through ignition sources such as discarding lit cigarettes, and road maintenance and disturbance can facilitate invasion by noxious weeds that can also carry fire.

Lands outside of the action area in the vicinity of the Waterfall Canyon Bridge, Phase I Passing Lane, and Shoulder Widening project areas are primarily undeveloped public lands used for livestock grazing and various outdoor recreational activities such as camping, rock climbing, off-road vehicle use, hunting, and target shooting, as well as mining activities at the Resolution Copper Mine. In the vicinity of the Phase II Passing Lane project area, most of the area on the north side of US 60 is privately owned by Freeport McMoran and is used for mining, while the south side of US 60 consists of public lands administered by the Forest and BLM (ADOT 2014a).

### **EFFECTS OF THE ACTION**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Direct and indirect effects to the Arizona hedgehog cactus will occur to plants within the Phase I Passing Lane project area, Shoulder Widening project area, and at SRP's Silver King waste disposal area. Construction activities associated with the addition of passing lanes, new shoulders, retaining walls, etc. will result in 18.48 acres of temporary disturbance and 30.50 acres of permanent land conversion. Of these amounts, it is anticipated that 8.61 acres of Arizona hedgehog habitat will be temporarily disturbed and 12.32 acres of the cactus' habitat will be permanently modified as a result of the activities. Approximately 30 plants grow in areas where cut and fill activities are planned. These plants would be removed from the project area prior to construction and transplanted off-site to Boyce Thompson Arboretum. Where possible, ADOT will take measures to protect any Arizona hedgehog cacti that are in the right-of-way but are not anticipated to be affected by cut and fill activities. ADOT's education awareness and flagging plants in the construction area so they can be avoided, is expected to minimize any effects to those plants.

Arizona hedgehog cacti occurring downhill of construction activities on US 60 have the potential to be affected by falling or sliding rock, or debris during construction. However, we anticipate there is a low likelihood that this would actually occur. The requirement for ADOT to work within the right-of-way includes containing debris associated with disturbance in the right-of-way. ADOT will take precautionary measures to ensure no impacts occur to Arizona hedgehog cacti outside of the right-of-way by clearly marking, fencing, or flagging the project limits, including the new and temporary easement (ADOT 2014a). Therefore, no effects to Arizona hedgehog cacti growing downhill of construction activities are anticipated to occur.

Indirect effects from the project include increased habitat fragmentation, primarily increasing the divide between plants growing on either side of the wider roadway. Disturbed areas may also increase the susceptibility for invasive species to invade the areas. Reseeding the disturbed areas with a native seed mix and noxious weed treatments after construction is completed will help restore the area and control the spread of weeds. Additionally, the development of a Noxious and Invasive Plant Species Treatment and Control Plan, control of noxious and invasive species prior to ground-disturbing actions, and inspection of equipment during construction should reduce and minimize the potential spread of invasive species or noxious weeds into Arizona hedgehog cactus habitat.

Routine maintenance (i.e., weed control and woody vegetation removal) in the right-of-way has occurred in the past and is expected to continue once construction is complete. The Arizona hedgehog cactus appears to be unaffected by these activities, and we do not expect that effects from such maintenance will occur in the future. Therefore, we do not anticipate any Arizona hedgehog cacti in the right-of-way to be affected by future routine maintenance.

The five plants located within the SRP Silver King waste disposal area are growing in places where we anticipate that they can be protected in place. During construction, ADOT will minimize impacts to the Arizona hedgehog cactus by depositing waste material on the existing fill slope along the substation access road before it is deposited in undisturbed areas. Arizona hedgehog cactus will be flagged during construction to increase their visibility to construction personnel. Therefore, we do not anticipate direct impacts to these plants, but there is some uncertainty on the amount of waste to be deposited. If a cactus cannot be protected in place and may be damaged or destroyed, it would be salvaged. In addition, the

deposition of waste material within Arizona hedgehog cactus habitat is estimated to result in the loss of 9.79 acres of habitat for the cactus and increase habitat fragmentation/degradation from other Arizona hedgehog cacti growing in this area.

We consider transplantation of the Arizona hedgehog cactus to an institution as a last resort. Because ADOT is required to work in the right-of-way and the majority of surrounding land is Federal, there is no available habitat in these areas where the cactus could be transplanted and remain within its natural habitat and not be subjected to potential effects from future Federal actions (i.e., protected in perpetuity). We also do not expect that all of the Arizona hedgehog cacti will survive once at Boyce Thompson Arboretum. Previously salvaged plants from US 60 to the Arboretum experienced a 100% survival the first and second year, 90% the third, and 75% percent the fourth year (BTA 2014). The mortality was attributed to extreme drought and a freeze. Despite these results, the transplanted Arizona hedgehog cacti to Boyce Thompson Arboretum from this project will provide some benefit to the species. The Arboretum will use these plants to help them to improve on methods for long-term care to maintain survival of these plants, which would have been destroyed otherwise by the project. These plants may also provide future opportunities for research about the needs of the species, and will be available for future reintroductions. The conservation measures, such as educating on-site personnel about the Arizona hedgehog cactus, flagging cacti in the project area to increase their visibility, and the other conservation measures should help to minimize adverse effects to the remaining 23 Arizona hedgehog cactus in the action area.

In summary, the project is anticipated to result in the loss from the wild of approximately 30 Arizona hedgehog cacti that will be salvaged and transplanted. Additional plants may need to be salvaged during actual construction but we anticipate this number to be small. The project will also result in the short-term disturbance to 8.61 acres of habitat and permanent loss of 12.32 acres of habitat.

## **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Most of the activities associated with transportation projects, such as future road construction, road maintenance, and improvement of access roads on the Forest will likely be federally funded. Because the action area is largely located within the boundary of the Forest, it is anticipated that future activities within the action area impacting the cactus would likely be subject to section 7 of the Act. Future non-Federal activities that are reasonably certain to occur on Federal land include future invasive or noxious weed control along the paved edge of US 60.

## **CONCLUSION**

After reviewing the current status of the Arizona hedgehog cactus, the environmental baseline for the action area, the effects of the proposed Oak Flat to Miami US 60 roadway enhancement project, and the cumulative effects, it is the FWS's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Arizona

hedgehog cactus. No critical habitat has been designated for this species therefore, none will be affected.

The project is not anticipated to substantially reduce the likelihood of survival and recovery of the Arizona Hedgehog cactus because the landscape impacts and loss of cacti will be a small fraction of what is currently known to exist. The approximate 12.32 acres of habitat loss and 26 plants represents less than 0.001% of the estimated area occupied by the plants and less than 0.004% of the currently known population.

We present this conclusion on the Arizona hedgehog cactus for the following reasons:

- The project's size and overall magnitude of effects would impact a small number of Arizona hedgehog cacti within the known rangewide population.
- The entire project will result in the loss of a small amount of occupied habitat compared to its known distribution.
- Salvage of approximately 30 plants, while they are no longer contributing to the wild population, will be maintained in ex-situ where they could be available for future reintroductions, research, and/or public education.
- The conservation measures are expected to minimize adverse effects to any Arizona hedgehog cactus located outside of the right-of-way easements and those located in the SRP Silver King waste disposal area.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or

destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that FHWA work with adjacent land managers and owners to establish protected areas within the Arizona hedgehog cacti's range where existing plants will be protected to improve the plant's status and to provide locations where plants affected by projects can be relocated and remain in the wild.
2. We recommend the FHWA work with ADOT and botanical institutions to develop standardized salvage protocols and best management practices for the Arizona hedgehog cactus within transportation projects to increase survival of plants in ex-situ.
3. We recommend that FHWA consider establishing a research program for the Arizona hedgehog cactus to more fully evaluate the conservation needs of the species.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

Certain project activities may also affect species that are protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA). The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the FWS. BGEPA prohibits anyone, without a permit issued by the FWS, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you believe migratory birds will be affected by the project, we recommend you contact our Migratory Bird Permit Office, P.O. Box 709, Albuquerque, NM 87103, (505) 248-7882, or [permitsR2mb@fws.gov](mailto:permitsR2mb@fws.gov). For more information regarding the MBTA, please visit the following websites:

<http://www.fws.gov/migratorybirds> and <http://www.fws.gov/migratorybirds/mbpermits.html>.

For information on protections for bald eagles under the BGEPA, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) that were published in the Federal Register on June 5, 2007. Existing take authorizations for bald eagles issued under the ESA became covered under the BGEPA via a final rule published in the Federal Register on May 20, 2008 (73 FR 29075). Our office is also available to provide technical assistance to help you with compliance.

### REINITIATION NOTICE

This concludes formal consultation on the Oak Flat to Miami US 60 roadway improvement project in central Arizona. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and 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 opinion; 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.

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying the following Tribes of its completion San Carlos Apache Indian Tribe. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

Should you require further assistance or if you have any questions, please contact Kathy Robertson at (602) 242-0210 (ext 232) or Mike Martinez at (ext 224). Please refer to the consultation number, 02EAAZ00-2012-F-0334 in future correspondence concerning this project.

Sincerely,

/s/ Brenda Smith for

Steven L. Spangle  
Field Supervisor

cc: (electronic):

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## Appendix A: Concurrence

### Ocelot

In April of 2010, a specimen found dead on the road along US 60 between Superior and Miami was collected, sent to Oregon for DNA testing, and determined to be a wild adult ocelot (AGFD 2010). Ocelots occur more frequently in southern Arizona than other parts of the state. There are two previous records, the most recent from the 1980s, documenting the species from central Arizona and within the Camp Verde area that suggests ocelots may be present in these areas albeit rare. Other than the 2010 specimen, no other ocelot sightings have occurred recently in central Arizona. Because there is some suitable habitat for the species in central Arizona, it is possible that ocelots could utilize this area. No surveys for ocelots have been conducted between the towns of Superior and Miami to determine presence or occurrence and/or to what extent the species may use the habitat (e.g., as dispersal or breeding habitat). The Phase I Passing Lane project area and Shoulder Widening project area encompasses approximately 1.68 miles in length, and the Phase II Passing Lane project is 1.60 miles in length. These sub-projects straddle the area where the 2010 specimen was found.

Recreation, road use, and road maintenance have the potential to disturb ocelots. Road widening can fragment habitat, create barriers to ocelot movement, and increase the likelihood of motor vehicle collisions with ocelots. A large portion of the Phase I Passing Lane and Shoulder Widening project will occur in areas not conducive to ocelot movement across the roadway due to the presence of steep walled canyons bordering the highway, particularly where the highway enters Devils Canyon. The Phase I Passing Lane and Shoulder Widening project areas end approximately 1.52 miles and 1.04, respectively, west of where the 2010 specimen was collected. The Phase II Passing Lane project area is approximately six miles east of where the specimen was collected and where the terrain would be more conducive to road crossing. Our assumption for this analysis is that ocelot may use US 60 as a dispersal corridor to facilitate movement through the areas between the towns of Superior and Miami, likely within the area near the community of Top of the World. The vegetation in the Phase I Passing Lane and Shoulder Widening areas are interior chaparral. However, there is thick chaparral scrub and pockets of Madrean evergreen woodland vegetation, suitable habitat for ocelots, near Phase II Passing Lane project area and just south of the highway.

Because of the uncertainties regarding their status, and the uncertainties regarding the potential for an ocelot to be killed from vehicle collisions, the lack of surveys and limited information available on the ocelot in central Arizona and the action area, it is difficult to determine that ocelots would be adversely affected by the proposed action.

We anticipate the effects of the proposed action will be insignificant or discountable because of the following:

- Ocelots are not known to regularly occur in central Arizona (there has only been one recent record of a male ocelot in central Arizona since 2010); therefore, there is a low likelihood that ocelots would be present during project implementation.

- All construction activities associated with widening US 60, including blasting along certain sections, would occur during daytime hours when ocelots are less active. The noise associated with construction activities could potentially disturb ocelots in the area by causing them to alter their behavior and/or avoid the construction area by using adjacent areas for dispersal, which could lead to an increase in energy expenditure. Because ocelots are more active at night, we do not anticipate that daytime noise would cause ocelots in the area to alter their behavior.
- Only 18.26 acres of vegetation will be disturbed by the project; none of which is considered occupied breeding ocelot habitat. Accordingly, we anticipate there is a low probability of disturbing feeding, breeding, or sheltering behavior.
- Highway US 60, and the portion that is within the action area, is an existing roadway with a posted speed limit of 55 miles per hour (MPH). While the addition of passing lanes would make it easier for travelers to maintain their current speed (e.g., the passing lane would enable drivers to pass slower moving vehicles), it is difficult to meaningfully measure the incremental difference in speed from the existing conditions and changes in driver behavior once passing lanes are completed. The implementation of “Watch for Wildlife” signs near the community of Top of the World is anticipated to reduce the likelihood of impacts to the ocelot by alerting drivers of potential presence of wildlife near the highway.
- The wider roadway may increase the risk of an ocelot crossing the road to be killed by a motorized vehicle. The terrain in the Phase I Passing Lane and Shoulder Widening project areas are largely steep walled canyons on either one side of the highway or both which would cause a barrier to ocelots trying to cross the road. It is our understanding the addition of passing lanes in Phase II would begin at a later date. If ocelots are detected between the start of Phase I and the start of Phase II, we will likely need to revisit our determination and consultation may need to be reinitiated to re-analyze potential effects to the ocelot.