



U.S. Department
of Transportation
**Federal Highway
Administration**

ARIZONA DIVISION

4000 North Central Avenue
Suite 1500
Phoenix, Arizona 85012-3500
Phone: (602) 379-3646
Fax: (602) 382-8998
<http://www.fhwa.dot.gov/azdiv/index.htm>

August 6, 2015

In Reply Refer To:

HSIP-088-A(202)
TRACS No. 088 MA 203 H8112 01C
Apache Junction to Tortilla Flat
Section 7 Formal Consultation
AESO/SE 2EAAZ00-2014-SLI-0555
Request for Formal Consultation

Submitted via email to incomingazcorr@fws.gov

Mr. Steve Spangle, Field Supervisor
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951

Attn: Mr. Robert Lehman, FHWA Liaison

Dear Mr. Spangle:

The Federal Highway Administration (FHWA), as the lead federal agency, in conjunction with the Arizona Department of Transportation (ADOT), is planning a safety improvement and pavement preservation project along State Route 88 from milepost (MP) 203.40 to MP 220.20. The project will occur entirely on land managed by the Tonto National Forest (TNF); a temporary construction easement will be obtained from the TNF for construction of the proposed action. The FHWA will be the lead federal agency but has designated ADOT as the non-federal representative for this project for purposes of Section 7 consultation.

The enclosed Biological Evaluation (BE) describes the proposed project and addresses the official list of threatened, endangered, proposed, and candidate species obtained via the Information, Planning, and Conservation (IPaC) decision support system on July 29, 2015 (Consultation Tracking Number 2EAAZ00-2014-SLI-0555). The Gila topminnow (*Poeciliopsis occidentalis occidentalis*) was evaluated in detail due to the presence of this species in the project area. The BE concluded that the proposed project “*may affect, and is likely to adversely affect*” the Gila topminnow; therefore, I am requesting the initiation of formal consultation for the Gila topminnow. The project also has the potential to affect individual Sonoran desert tortoises (*Gopherus morafkai*), a candidate species. Please provide technical assistance for avoiding or minimizing effects on Sonoran desert tortoises.

Please review the document and provide a Biological Opinion at your earliest convenience. If you have any questions or would like additional information, please contact Rebecca Yedlin

(rebecca.yedlin@dot.gov, 602-382-8979) or Kris Gade at ADOT (kgade@azdot.gov, 602-292-0301). Thank you for your continued assistance.

Sincerely yours,



 Karla S. Petty
Division Administrator

Enclosure



Approved July 30, 2015

Arizona Department of Transportation

Environmental Planning Group

Biological Evaluation

Apache Junction to Tortilla Flat

Federal Project No. STP-088-A(202)T

TRACS No. 088 MA 203 H8112 01C

US Fish and Wildlife Service Consultation

2EAAZ00-2014-SLI-0555

July 29, 2015

Submittal Number 6

All information contained in this document is the property of ADOT. ADOT approval is required prior to reproduction or distribution.

Biological Evaluation for **Apache Junction to Tortilla Flat**

Federal Project No. STP-088-A(202)T
TRACS No. 088 MA 203 H8112 01C

Prepared for



Arizona Department of Transportation
Environmental Planning Group
1611 West Jackson, Mail Drop EM02
Phoenix, Arizona 85007

Prepared by

Logan Simpson
51 West Third Street, Suite 450
Tempe, Arizona 85281

July 2015

All information contained in this document is the property of ADOT. ADOT approval is required prior to reproduction or distribution.

Table of Contents

Executive Summary	ES-1
1. Project Location	1
2. Project Description.....	1
3. Location Description	13
4. Species Identification	15
5. Species Evaluation - Threatened, Endangered, Proposed, and Candidate Species	18
Gila Topminnow	18
Sonoran Desert Tortoise	25
6. Species Evaluation - Bald and Golden Eagle Protection Act	30
Bald Eagle	30
7. Species Evaluation - Sensitive Species.....	35
Lowland Leopard Frog	35
Mapleleaf False Snapdragon	37
Pima Indian Mallow	39
8. Mitigation Measures.....	40
9. Coordination	43
10. Literature Cited	44
11. Additional Information	46
12. Signatures.....	46

LIST OF FIGURES

Figure 1. Project location	2
Figure 2. Project area	3
Figure 3. Rock spire removal area, Tortilla Creek ford crossing, and Mesquite Creek low-water crossing.....	6
Figure 4. Tortilla Creek ford crossing construction area	10
Figure 5. Gila topminnow reintroduction and survey locations	20
Figure 6. Bald eagle nest location (Tortilla Creek Breeding Area).....	33

LIST OF TABLES

Table ES-1. Determination of effect for threatened, endangered, proposed, and candidate species, and bald eagles	ES-1
Table 1. Acreage of expected ground disturbance within the project limits	5

Table of Contents (continued)

LIST OF TABLES (CONTINUED)

Table 2. Recorded flows in Tortilla Creek below the ford crossing	14
Table 3. Species evaluated in detail	16
Table 4. Species excluded from evaluation and justification for their exclusion	16

LIST OF APPENDIXES

Appendix A. State Sensitive Species and Migratory Bird Treaty Act Analysis	
Appendix B. Project Area Photographs	
Appendix C. Agency Correspondence	
Appendix D. Project Plan Excerpts and Exhibits	
Appendix E. Arizona Game and Fish Department Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (Revised October 23, 2007)	

Executive Summary

The Arizona Department of Transportation (ADOT), in coordination with the Federal Highway Administration (FHWA), is planning a safety improvement and pavement preservation project along State Route 88 (SR 88) in the vicinity of Canyon Lake in Maricopa County, Arizona. The project limits along SR 88 extend from milepost (MP) 203.40 to MP 220.20. The project would occur entirely on land managed by the Tonto National Forest (TNF). A temporary construction easement would be needed for construction of the proposed action.

The proposed action consists of removing and replacing the pavement between MP 203.40 to MP 213.35, stabilizing the road shoulders, and paving existing and new turnouts and pullouts; applying a double seal coat on the existing roadway and paved turnouts and pullouts between MP 213.35 and MP 220.20 (including the low-water crossing of Mesquite Creek); constructing spot repairs at four locations; reconstructing curves at six locations; removing a large rock spire from above the road at MP 212.70; repairing the eastbound approach at the Boulder Canyon Bridge; repairing the concrete ford across Tortilla Creek near Tortilla Flat; reconstructing existing guardrail and constructing new guardrail at various locations to meet current standards; installing a dynamic message sign and camera at MP 211.10; installing new signs; marking/stripping the roadway; and controlling weeds using chemical and manual methods, as appropriate.

This Biological Evaluation analyzes the effects of the proposed action on threatened, endangered, and sensitive (TES) species potentially occurring in the project area, including federally-listed threatened, endangered, proposed, and candidate species; bald eagles; and sensitive species that are managed by the TNF. Various best management practices and mitigation measures (identified in Section 8 – Mitigation Measures) would be implemented by ADOT and its contractor to minimize the potential adverse effects to TES species. The determination of effect for TES species is summarized below in Table ES-1.

Table ES-1. Determination of effect for threatened, endangered, proposed, and candidate species, and bald eagles

Species	Status ^a	Determination
Gila topminnow (<i>Poeciliopsis occidentalis occidentalis</i>)	ESA LE	May affect, likely to adversely affect
Sonoran desert tortoise (<i>Gopherus morafkai</i>)	ESA C USFS S	May impact individuals, but is not likely to result in a trend toward loss of viability
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA USFS S	No impact

^a Status definitions: BGEPA=Bald and Golden Eagle Protection Act, C=Candidate, ESA=Endangered Species Act, LE=Listed Endangered, S=Sensitive, USFS=US Forest Service

1. Project Location

This safety improvement and pavement preservation project is located along State Route (SR) 88 near Apache Junction, in Maricopa County, Arizona (Figure 1). The project limits along SR 88 extend from milepost (MP) 203.40 to MP 220.20 (Figure 2). The project would occur entirely on land managed by the Tonto National Forest (TNF). The limits of a roadway easement across TNF land are unknown so the Arizona Department of Transportation (ADOT) is coordinating the project closely with the TNF. A temporary construction easement would be needed for construction of the proposed action. The cadastral location for this project includes portions of Sections 4, 5, 8–12, 17, 19, 20, 30, and 31 Township 2 North, Range 9 East, and portions of Sections 4, 5, 7, 8, and 9, Township 2 North, Range 10 East (Gila and Salt River Baseline and Meridian).

Throughout this Biological Evaluation, the term “project limits” is used to represent the construction footprint (area of disturbance), while the term “project area” also includes surrounding lands, outside but adjacent to the project limits. The term “project vicinity” is used to denote a more expansive landscape context.

The project limits for this project are defined as a 30-foot-wide corridor on either side of the SR 88 centerline between MP 203.40 and MP 220.20 for pavement preservation, shoulder stabilization, and pavement of existing turnouts and pullouts; a large boulder removal area measuring approximately 1,200 feet by 700 feet at MP 212.70; staging areas at eastbound (EB) MP 201.90, EB MP 208.00, EB MP 208.40, westbound (WB) MP 213.00, and EB and WB MP 214.50 that extend outside of the 30-foot-wide corridor on either side of the SR 88 centerline; reconstruction of the Tortilla Creek ford crossing that would extend more than 30 feet from the SR 88 centerline, and six curve reconstruction locations that would also extend more than 30 feet from the SR 88 centerline.

2. Project Description

Proposed Action

ADOT, in coordination with the Federal Highway Administration (FHWA), is planning a safety improvement and pavement preservation project along SR 88. Within the project area, SR 88 is a two-lane undivided highway consisting of one 11-foot-wide travel lane in each direction with no shoulders. Several sections of the roadway have inconsistent curves that force motorists to make sudden steering adjustments to maintain vehicle control while in the curve and many sections of the roadway exhibit eroding or steep edge-of-pavement, which makes pulling off the road or recovering control of a vehicle that has drifted from the

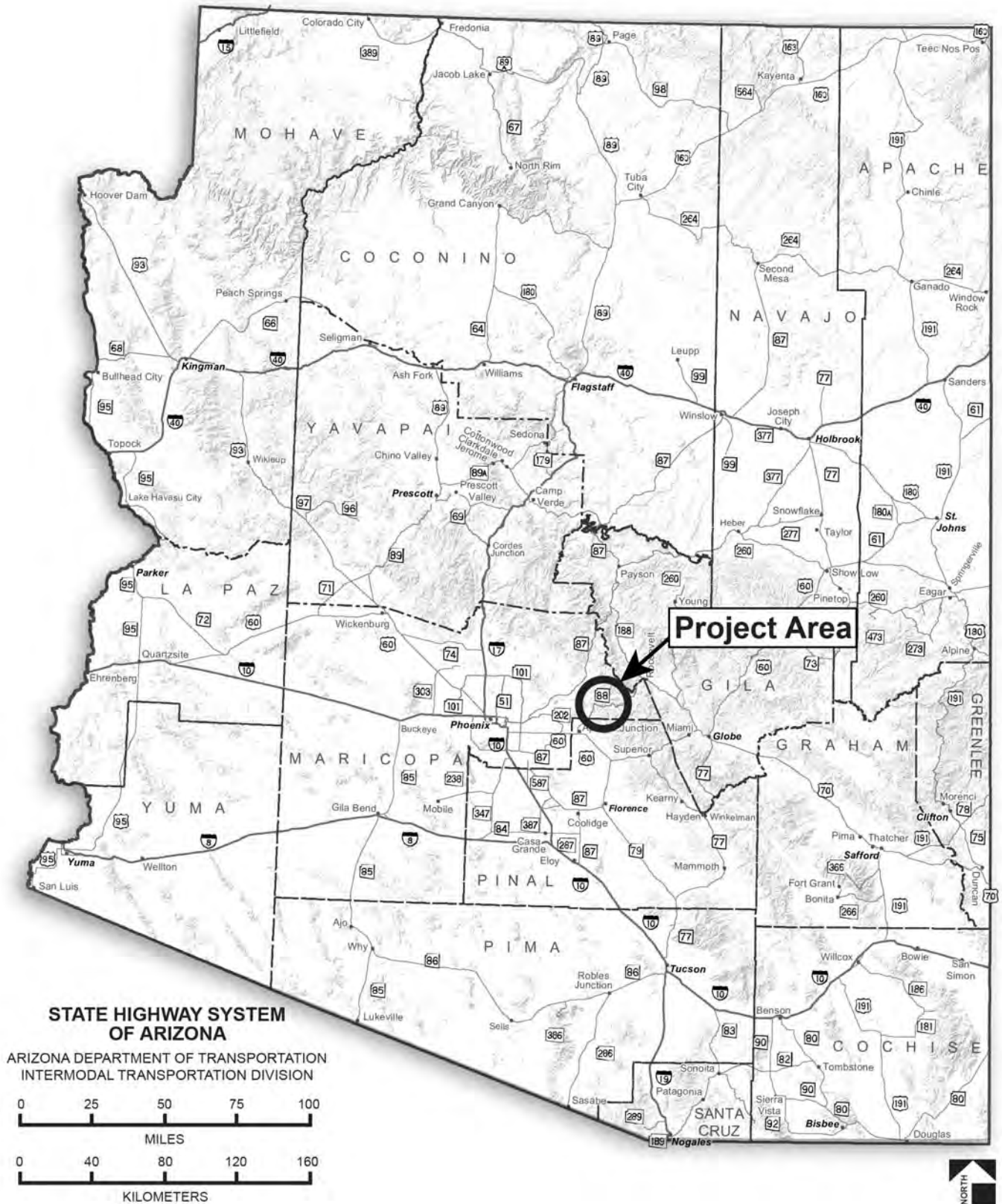
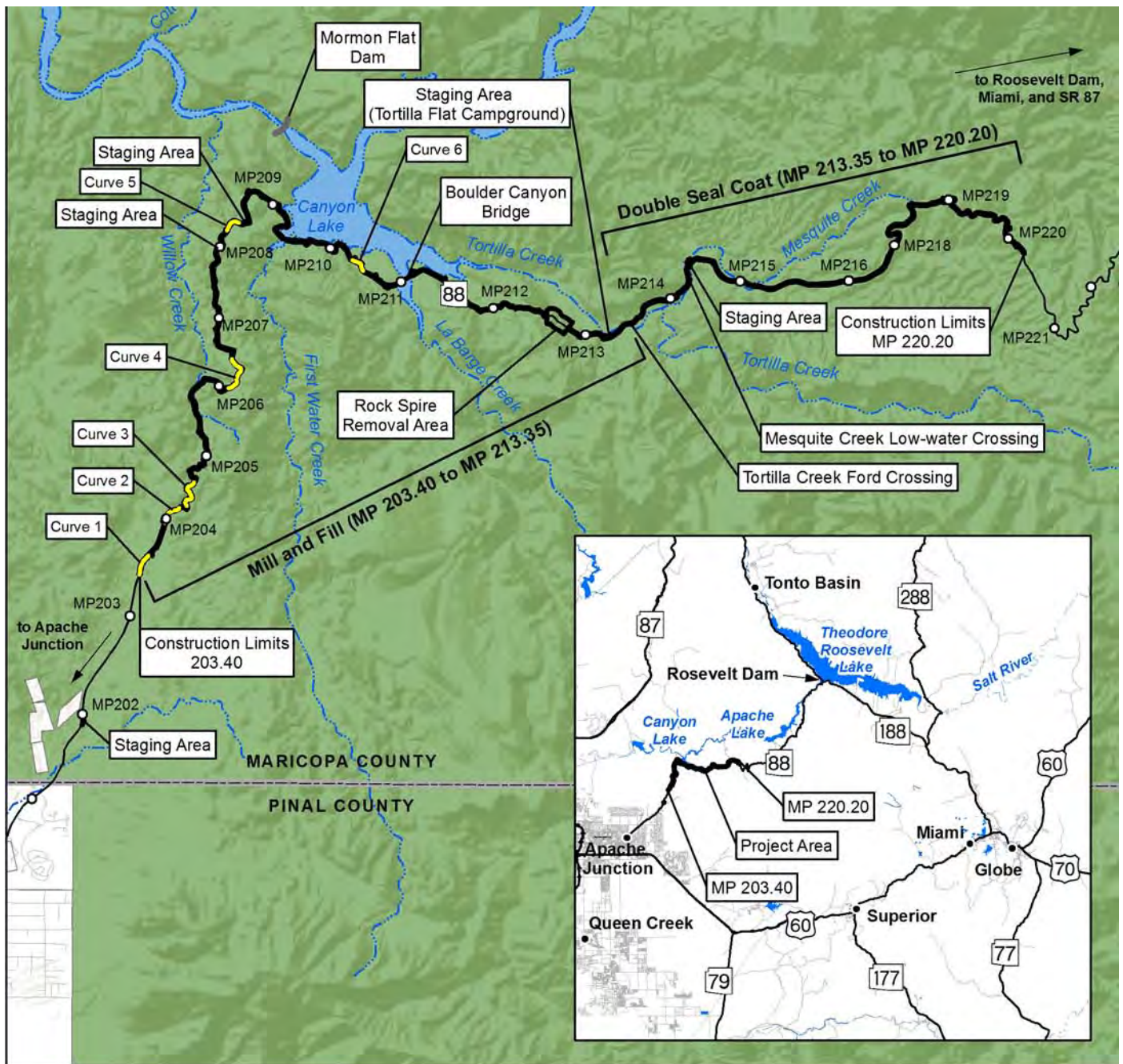


Figure 1. Project location



Source: Land Ownership GIS Coverage provided by Arizona State Land Department (2012); Arizona Transportation Information System GIS Coverage (2007)

Key

- Project Area
- Curve Improvements
- Tonto National Forest
- Private Land

Miles
0 2



Figure 2. Project area

Apache Junction to Tortilla Flat
Federal Project No. STP 088-A(202)T TRACS No. 088 MA 203 H8112 01C

July 2015

travel lane more difficult. At MP 212.70, a large rock spire approximately 100 feet above the roadway exhibits signs of a decomposing foundation and cracking where the rock adheres to the cliff face, creating a rockfall hazard. Safety improvements are needed to correct these identified issues.

In addition to these safety issues, the pavement surface of SR 88 throughout the project area has degraded from vehicular traffic and weathering. Surface water flows due to precipitation have eroded some of the roadway surface and underlying material at the transition to the eastbound Boulder Canyon Bridge, requiring regular maintenance. Finally, the surface of the concrete ford crossing of Tortilla Creek has cracked and is deteriorating with age. The purpose of this project is to correct safety issues and maintain the integrity of the roadway surface to provide a safe, smooth ride for motorists along SR 88, while maintaining the road's scenic and historic contexts and character.

The scope of work would consist of:

- Removing and replacing the pavement between MP 203.40 to MP 213.35, stabilizing the shoulders, and paving existing and new turnouts and pullouts
- Installing a safety edge between MP 203.40 and MP 213.35
- Applying a double seal coat on the existing roadway and paved turnouts and pullouts between MP 213.35 and MP 220.20 (including the low-water crossing at Mesquite Creek)
- Stabilizing the road shoulders as needed throughout the project area
- Reconstructing the curves at the following locations:
 - o Curve 1 – MP 203.40 to MP 203.60
 - o Curve 2 – MP 204.24 to MP 204.36
 - o Curve 3 – MP 204.43 to MP 204.53
 - o Curve 4 – MP 206.32 to MP 206.50
 - o Curve 5 – MP 208.20 to MP 208.50
 - o Curve 6 – MP 210.40 to MP 210.50
- Modifying existing culverts, as needed to accommodate the reconstructed curves
- Removing a large rock spire above the road at MP 212.70
- Repairing the eastbound approach at the Boulder Canyon Bridge (MP 211.05) by removing and replacing 100 feet of pavement
- Repairing the concrete ford across Tortilla Creek near Tortilla Flat (MP 213.3)
- Constructing spot repairs of the roadway at the following locations:
 - o MP 218.70 WB lane
 - o MP 219.10 EB lane
 - o MP 219.20 EB lane
 - o MP 219.60 WB lane

- Reconstructing existing guardrail and constructing approximately 355 feet of new guardrail at various locations to meet current standards
- Installing new signs including a dynamic message sign and camera at WB MP 211.10
- Marking/striping the roadway
- Controlling weeds using chemical and manual methods, as appropriate

While most of the work would take place on the existing pavement, ground disturbance and vegetation removal would be required in various locations along the route to reconstruct curves, construct spot repairs, reconstruct and add new guardrail, remove a large rock spire that is perched above the roadway, and repair the concrete ford across Tortilla Creek (Figure 3). An increase in noise levels would occur during construction and return to the existing condition following construction. Blasting may be required to dislodge the large rock spire/boulder so that it can be removed from its current location above the roadway. If required, blasting would occur as a single event for the purpose of dislocating the rock spire at its point of attachment, and would not be used for other portions of the project. These activities are described in greater detail below; excerpted plan sheets are provided in Appendix D. These sheets provide general examples of the way the work may be conducted; the contractor may elect to make changes to the plan of work within the defined disturbance areas.

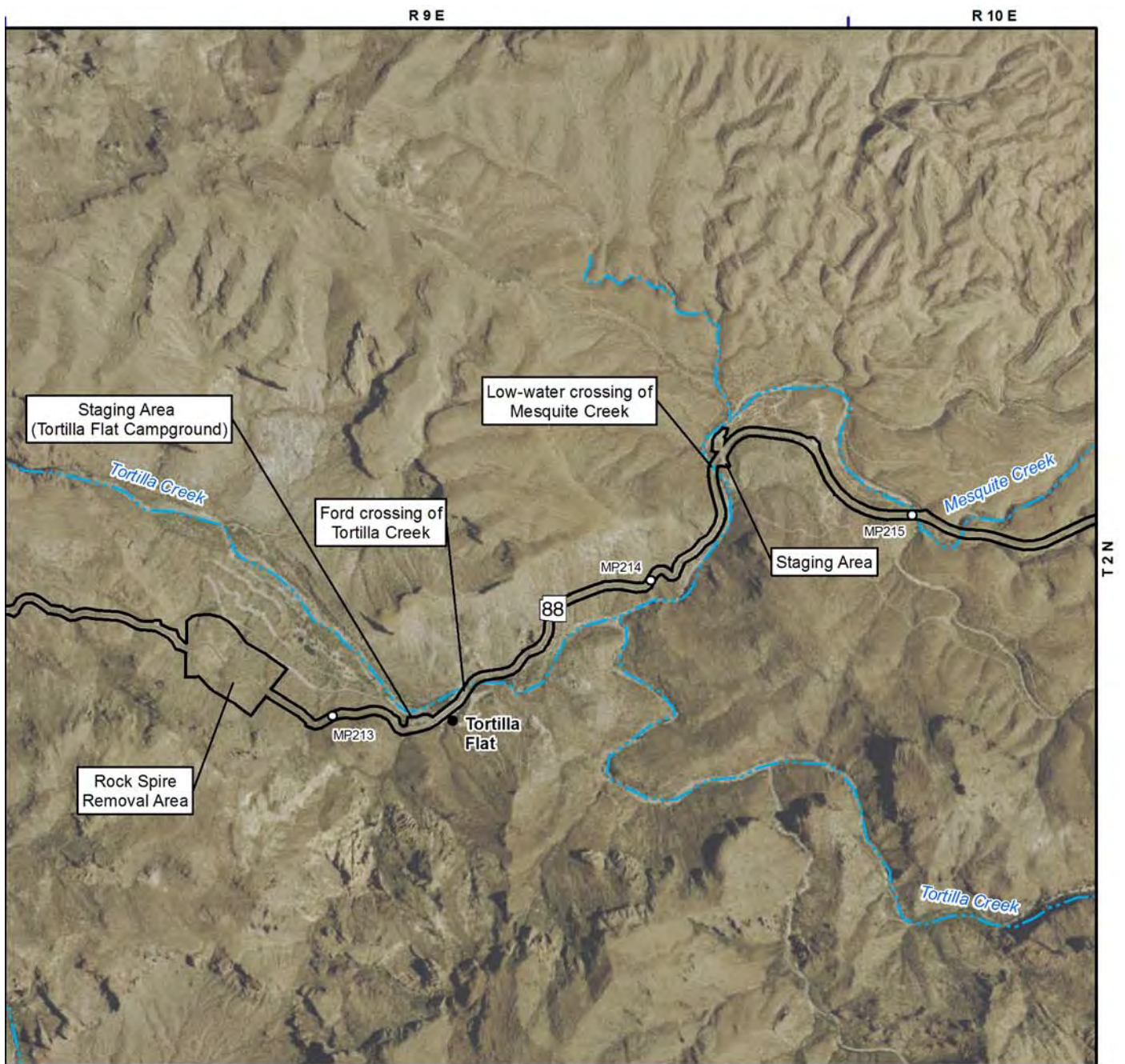
Table 1 provides a breakdown of the anticipated project-related ground disturbance.

Table 1. Acreage of expected ground disturbance within the project limits

Project Action	Expected Ground Disturbance (acres)
Pavement preservation (includes vegetation removal up to 3 feet from the edge of pavement for construction of a safety edge), guardrail reconstruction, and sign replacement	15
Paving of pullouts/turnouts (no vegetation removal required)	1
Curve reconstruction (total of six curve locations)	2
Reconstruction of the Tortilla Creek ford crossing	0.5
Rock spire/boulder removal	1
Total	19.5

Pavement Preservation, Guardrail Reconstruction, and Sign Replacement

Pavement preservation from MP 203.40 to MP 213.35 would consist of milling 2 inches of the existing roadway and paving with 2.5 inches of asphaltic concrete and 0.5 inch of asphaltic concrete friction course (i.e., mill and fill). Pavement preservation from MP 213.35 to MP 220.20 (which includes the low-water crossing of Mesquite Creek at MP 214.37; see Figures 2 and 3) would consist of a double application seal coat over the existing pavement. Repaving of the existing roadway and paving of existing pullouts and



Source: Arizona Transportation Information System GIS Coverage (2013)

Key

Project Area

Miles
0 0.5



Figure 3. Rock spire removal area, Tortilla Creek ford crossing, and Mesquite Creek low-water crossing

turnouts would be accomplished using heavy equipment that could include graders, water trucks, milling machines, tack trucks, dump trucks, pavers, and compactors. The application of the double seal coat would require the use of similar equipment, with the exception of milling and paving machines. The contractor would be required to use best management practices (BMPs) to ensure no material enters surface waters during paving operations, including both Tortilla and Mesquite creeks. Guardrail reconstruction, construction of new guardrail, and sign replacement (including construction of new foundations) would be accomplished using heavy equipment that would include graders, drill rigs, and work trucks.

A safety edge consisting of a tapered edge of pavement would be constructed from MP 203.40 to MP 213.35 (in the mill and fill section of the project) to avoid having a drop-off at the edge of pavement. Prior to placement of the safety edge, vegetation would be cleared up to 3 feet from the existing edge of pavement to prepare the road shoulder for construction of the safety edge; following placement of the safety edge the adjacent unpaved material would be graded flush with the top of the pavement to cover the tapered edge of pavement. Some of the disturbance associated with the safety edge would occur in unvegetated areas; however, throughout much of the project area, roadside shrubs, subshrubs, grasses, and forbs would need to be removed to prepare the road shoulder for placement of the safety edge. All disturbed ground that would not be landscaped or otherwise permanently stabilized by construction would be reseeded with a native seed mix and allowed to revegetate following project completion.

Paving of Pullouts/Turnouts

The project would include repaving (i.e., mill and fill) of existing paved pullouts and turnouts. Selected existing unpaved pullouts/turnouts would be graded according to plan specifications and paved with asphaltic concrete.

Curve Reconstruction

Curve reconstruction at the six locations noted above would generally consist of the scaling back of existing cut slopes and extending of fill slopes to allow for the existing roadway to be shifted slightly, providing a more optimal alignment at each of the curves. Curve reconstruction would require the clearing and grubbing of existing vegetation, excavation of cut slopes adjacent to the existing roadway, and the placement of fill material on steep slopes below the existing roadway. The existing culverts would be extended, as necessary to accommodate the reconstructed curves.

Earthwork would be a significant component of the curve reconstruction work due to steep fill slopes and large hill cuts. The hill cuts would mostly occur in rocky material; this work is anticipated to be completed with conventional excavation equipment. In areas where a hill cut is required, a 4-foot-wide ditch would be constructed adjacent to the roadway. New fill slopes be constructed by cutting benches into the existing

embankment fill prior to placement of the new fill material. Earthwork would be accomplished using a combination of heavy equipment such as excavators, loaders, dump trucks, bulldozers, backhoes, and water trucks. Measures to control post-construction erosion, such as placing rock rip-rap or seeding with native species, would be installed following the creation of new fill slopes. The rock rip-rap would match the color of the natural rock in the surrounding area.

Reconstruction of the Tortilla Creek Ford Crossing

The existing ford crossing is 23.5 feet wide and consists of a 17.5-foot-wide section that was constructed as part of the original ford crossing, and a 6-foot-wide section that was added on later to provide a wider crossing (see Photo 36 in Appendix B). Reconstruction of the concrete ford crossing of Tortilla Creek would require excavation and the removal of the 6-foot-wide southern (upstream) portion of the ford; the 17.5-foot-wide northern (downstream) portion of the ford would remain in place, but would be repaired to improve its condition. Work at the ford crossing is expected to take approximately 6 weeks. Dewatering is expected to be necessary to complete the repairs.

Repairs to the concrete ford crossing of Tortilla Creek would consist of the following actions:

- Both Sides of the Ford: There is some asphalt remaining on top of the concrete ford that would be milled off prior to reconstruction of the ford.
- Downstream Side of the Ford: Repair the existing cracks and spalls. The cracks would be vee-notched along their length with a concrete saw and filled with a suitable material. The spalls would be repaired using a structural concrete patching material.
- Upstream Side of the Ford: Remove the entire 6-foot-wide section added to the length of the ford in the 1940s and replace with a new reinforced concrete roadway with cut-off walls (refer to the excerpted plan sheets in Appendix D). The new portion would be tied to the existing downstream side of the ford with dowels. The new portion would have transverse joints constructed to match the locations of the existing joints in the downstream side.
- Drainage: The existing 18-inch corrugated metal pipe culvert is severely corroded. The pipe would be left in place under the downstream side of the ford and lined with a smaller steel pipe (15-inch) and the annulus between the old and new pipes would be filled with grout. This 15-inch pipe would extend through the upstream side and have a trash rack (i.e., a metal grate) on the upstream side to keep larger debris from passing through the pipe. The trash rack would consist of three metal bars (spaced approximately 5 inches apart) placed across the upstream opening of the pipe.
- A methacrylate sealer would be applied to the top and upstream face of the ford after the concrete has dried to prevent water intrusion and provide a barrier to protect surface waters from the

potential adverse effects of concrete leaching.

- The site would be restored to pre-construction conditions and the vegetation would be allowed to reestablish naturally.
- The affected wetland areas would be mitigated through restoration or using in-lieu fees.

The ford crossing work would be restricted to the period from April through June, when flows are typically low and sometimes non-existent. The contractor would have some flexibility in their choice of methods to complete the work; the description below describes a general concept of how the work could be completed. The sequence of construction at the ford crossing would begin with installation of traffic control to limit traffic to one lane on the downstream side of the ford. Fish/frog removal activities would be completed in any surface water before equipment is allowed to enter the channel. Block nets would be installed and monitored to prevent fish and frogs from entering the work area if surface flows are present. If needed, berms, concrete barriers, or other temporary structure(s) may be installed in order to aid in dewatering the work area. These barriers may form a complete or partial barrier across the channel. Figure 4 shows that anticipated area of disturbance at the ford crossing; project plan excerpts are also included in Appendix D.

Equipment access to the work area would require grading within the construction area adjacent to and within the channel on the upstream side of the ford using an excavator or similar earth-moving equipment to create an access road. Vegetation including several Goodding's willow trees and small patches of wetland vegetation (e.g., buttonbush, giant reed) would be impacted by vegetation clearing on the upstream side of the ford crossing. The work area directly adjacent to the upstream side of the ford would be dewatered to allow concrete work to occur; this may be accomplished by excavating a sump for the purpose of pumping water from the upstream side of the ford to the downstream side. One or more pumps with associated hoses would likely be used to dewater the work area. Pump intakes would be screened to avoid intake of fish. If only groundwater is present within the work area and there are no surface flows, block nets and monitoring would not be required, but if surface flows enter the project area, work would stop until block nets have been installed and any fish/frogs removed from the work area. Measures to prevent erosion and discharge of sediment-laden water (e.g., settling basins, turbidity socks) would be installed on the downstream end of the hose(s). Only foot traffic would be allowed within the low flow channel on the downstream side of the ford; vehicles may access the area for limited use to place equipment such as water tanks or settling basins above the Ordinary High Water Mark defined in the Jurisdictional Determination and approved by the US Army Corps of Engineers (US Army Corps of Engineers 2015).



Source: Arizona Transportation Information System GIS Coverage (2013)

Key

Ford Crossing Construction Area

Miles
0 0.025



Figure 4. Tortilla Creek ford crossing construction area

Heavy equipment would access the work area to remove the exterior concrete of the deteriorating upstream portion of the ford, along with the associated fill material from inside the ford structure. The existing culvert pipe would be cut off even with the remaining ford cutoff wall and the remaining section of pipe would be cleared of any blockages with hydrovac trucks that use a combination of pressurized water and vacuum hoses to remove material. The hydrovac trucks would be parked on top of the concrete ford and/or the access road on the upstream side of the ford; one truck would excavate/vacuum at the upstream end of the culvert pipe and the other truck would vacuum at the downstream end of the pipe at the same time to minimize any discharge of material or water from the pipe during the pipe cleanout. Turbidity socks or other control measures would be temporarily placed on the downstream side of the pipe opening to contain any accidental discharge of water or excavated material. The new culvert pipe would be installed by inserting it inside the existing pipe and pushing it into place with an excavator or similar equipment. The space between the old and new pipes would be grouted with non-shrinking grout to secure the new pipe in place. The contractor would hand-place grout at the downstream pipe opening 24 hours prior to pumping grout into the rest of the space, or use another method approved by the Engineer (e.g., installation of a bulkhead or collar on the downstream end of the pipe) to prevent the discharge of grout to the downstream channel when it is pumped into the space between the two pipes.

After grouting the new culvert pipe into place, the new upstream section of the concrete ford would be constructed. This would likely be accomplished by building wooden forms for the upstream cutoff wall and filling them with concrete. Concrete trucks may be located in the work area on the upstream side of the ford or on the roadway adjacent to the work area. The concrete would be allowed to cure for at least 24 hours before allowing surface water to come into contact with it. The wooden forms would be removed and fill would be placed inside the empty space between the existing ford and the new upstream cutoff wall. Forms would be constructed for the subsequent pouring of concrete for the top of the new section of the ford and removed following curing of the concrete. The dewatering measures would then be removed and the upstream side of the ford would be recontoured to the preconstruction elevations as needed. The cracks and spalls on the downstream side of the ford would be repaired by grinding them to vee-notches and filling them with concrete patch material. Once the patch material has cured, the top of the ford would be coated with a methacrylate sealant.

Methacrylate is commonly used to seal concrete to prevent water intrusion. It is provided as a two part or three part mix. There are specific requirements to ensure the compound is mixed safely. Up to five gallons of methacrylate sealant would be mixed and applied to the concrete by hand. BMPs would be used to prevent methacrylate from entering the channel or surface water of Tortilla Creek. The methacrylate would be applied during clear weather when surface flows that might overtop the ford are not likely to occur.

Methacrylate dries quickly (within 2 to 4 hours) and has been shown to provide effective protection from concrete leaching and to buffer the increase in pH that results when water is exposed to concrete to a level that is generally safe for aquatic organisms (see Law and Setunge 2014).

The project would require disturbance to jurisdictional waters of the United States and jurisdictional wetlands as regulated by the US Army Corps of Engineers under Section 404 of the Clean Water Act; therefore, a Section 404 Permit would be required. All construction activities would comply with the terms and conditions of the US Army Corps of Engineers Section 404 Permit and Section 401 Water Quality Certification. Because more than 1 acre of land would be disturbed, an Arizona Pollutant Discharge Elimination System (AZPDES) permit would be required. To comply with the terms and conditions of these permits, discharges of dredged or fill material (including all earthwork activities, such as clearing, grading, filling, and excavating) into watercourses would be minimized or avoided to the maximum extent practicable and would not involve the use of unsuitable material or toxic pollutants in toxic amounts. As part of the AZPDES permit, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented, which would minimize the transport of sediment by requiring the contractor to use BMPs for storm water and erosion control.

Rock Spire/Boulder Removal

Removal of the large rock spire/boulder from where it is currently perched above the roadway at MP 212.70 would require temporary closure of the roadway (see Photos 31–35 in Appendix B and the rock spire removal figure in Appendix D). The existing roadway would be protected with 0.75-inch thick, 4-foot by 8-foot steel plates. The contractor would be permitted to select the method of boulder removal, provided that the selected method minimizes disturbance to the slope surrounding the unstable boulder. The boulder removal equipment would be carried on foot across the surrounding slopes to minimize disturbance. The contractor would utilize cranes, compressors, generators or other equipment from the roadway to facilitate boulder removal. Blasting is an acceptable method of boulder removal; all blasting would be performed in conformance with ADOT's Standard Specifications (i.e., overshooting or any method of blasting that might cause damage to the roadway section or highway structures, or that might be dangerous or destructive to adjacent property or the landscape, would not be permitted). Other acceptable methods of boulder removal include dislodgement with a hydraulic jack, mechanical toppling, or excavation at the rock base. The boulder, or the remaining fragments of the boulder, would be removed from the roadway and placed on the slope immediately below the roadway. Large fragments may need to be broken down further to facilitate their removal from the roadway. The roadway would be repaired, if damaged, and reopened to traffic as soon as possible after the boulder is dislodged from its original position.

Construction Timing, Road Closures, and Staging

Construction is anticipated to begin in mid-2017 and last approximately 12 months. The road reconstruction work would occur in either 2017 or 2018, depending on when the contract is awarded. During rock removal activities at MP 212.70, SR 88 would be temporarily closed in both directions. The closure is anticipated to be up to 8 hours in duration. Warning of the road closure would be provided to the public. Single lane closures would be required during the majority of the construction of the project. A temporary construction easement would be needed for construction of the proposed action. Contractor staging during construction would occur within designated staging areas only as shown on Figure 2; no vegetation removal would occur within the designated staging areas.

3. Location Description

The project area is located within the Sonoran Desert Ecoregion, which has high summer temperatures, mild winters, and a characteristic bimodal rainfall pattern (Marshall et al. 2000). The topography in the project area is rugged and mountainous, with steep hill cuts and slopes bordering SR 88 throughout the project area. A portion of the roadway skirts the southern edge of Canyon Lake, which was formed by the construction of the Mormon Flat Dam in 1925 and is the smallest of the four reservoirs along the Salt River. The Superstition Wilderness Area borders SR 88 to the east and south of the project area along most of its length. Lands in the project vicinity are primarily undeveloped public lands used for various outdoor recreational activities such as boating, hiking, camping, rock-climbing, and hunting.

The project area begins at its western end at approximately 2,100 feet in elevation and climbs to 2,350 feet before dropping to 1,680 feet in the vicinity of Canyon Lake. Heading east, the project area reaches 1,755 feet in the vicinity of Tortilla Creek, and then climbs to approximately 2,860 feet at its eastern end.

Canyon Lake is a popular recreation area for residents of the Phoenix metropolitan area. There are three recreation sites at the lake that are open year-round: the Acacia Picnic Site (MP 210.4) with 40 picnic spaces, a designated swimming site, and a pair of boating ramps; the Palo Verde Recreation Site (MP 210.6) with eight picnic spaces; and the Boulder Creek Recreation Site (MP 210.75) with eight picnic spaces. The Canyon Lake Marina and Campground (MP 211.15) offers a variety of marina services, a restaurant, a campground, and a beach area. Canyon Lake is a fishable lake that contains walleye (*Sander vitreus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), striped bass (*Morone saxatilis*), rainbow trout (*Oncorhynchus mykiss*), bluegill (*Lepomis macrochirus*) and other sunfish (*Lepomis* spp.), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and crappie (*Pomoxus* spp.).

There are numerous culverted crossings of ephemeral drainages in the project area, and two bridges that traverse inlets to Canyon Lake: the First Water Creek Bridge (Structure No. 26) at MP 209.62 and the Boulder Canyon Bridge (Structure No. 193) at MP 211.05. Two notable drainages are also crossed via at-grade, low-water crossings: Tortilla Creek (MP 213.3) and Mesquite Creek (MP 214.37; refer to Figures 2 and 3). Tortilla Creek is intermittent in the project area, and nearly perennial below the ford crossing at SR 88; base flows at the crossing get down to less than 1 gallon per minute and no flow has been recorded at times, though water is typically still present in small pools below the crossing (K. Kessler, TNF, pers. comm. 2014; see Photos 37 and 38 in Appendix B). Flow measurements taken just below the ford crossing were provided by the TNF (Table 2). Mesquite Creek is also intermittent in the project area; standing water and scant flows across the roadway were observed at the SR 88 low-water crossing of Mesquite Creek during a site visit on August 26, 2014 (see Photos 41 and 42 in Appendix B).

Table 2. Recorded flows in Tortilla Creek below the ford crossing

Month	2010 (cfs)	2011 (cfs)	2012 (cfs)
January	Not available	0.39296	0.0728
February	Not available	0.1033	0.0839
March	Not available	0.54846	0.0823
April	Not available	0.02566	0.01363
May	0.0549	0.0201	0.0014
June	0.0106	Not available	Not available
July	0.001	Not available	Not available
August	0.0021	Not available	Not available
September	0.00315	0.00	Not available
October	Not available	Not available	Not available
November	0.0014	0.00	Not available
December	Not available	0.95254	Not available

Source: Pers. comm. from K. Kessler, TNF, Jan 2015.

Note: "Not available" indicates that no measurement is available for that month.

The project area is situated within the Arizona Uplands subdivision of the Sonoran Desertscrub Biotic Community (Turner and Brown 1994), which is characterized by high temperatures, generally low precipitation, and an assemblage of vegetation and wildlife species that is specifically adapted to these conditions. Lush desertscrub vegetation consisting of a paloverde-mixed cacti community that is dominated by desert trees, shrubs, and succulents borders SR 88 throughout the project area. Beginning at the western end of the project area, the vegetation is quite dense and there are many trees and large shrubs present (see Photo 3 in Appendix B); heading east from Tortilla Flat, more grasses and fewer trees are present (see Photo 51 in Appendix B), particularly to the east of MP 216 where the roadway primarily traverses ridgelines and hilltops.

Plant species that were observed within the paloverde-mixed cacti community in the project area include

foothills paloverde (*Parkinsonia microphylla*), velvet mesquite (*Prosopis velutina*), cat-claw acacia (*Acacia greggii*), triangle-leaf bursage (*Ambrosia deltoidea*), creosotebush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), hopbush (*Dodonaea viscosa*), jojoba (*Simmondsia chinensis*), fairy duster (*Calliandra eriophylla*), ocotillo (*Fouquieria splendens*), and a variety of cacti including saguaro cacti (*Carnegiea gigantea*), buckhorn and chainfruit chollas (*Cylindropuntia acanthocarpa* and *C. fulgida*), Christmas cacti (*Cylindropuntia leptocaulis*), pincushion cacti (*Mammillaria grahamii*), prickly pear cacti (*Opuntia* spp.), and California barrel cacti (*Ferocactus cylindraceus*).

Common roadside species in the project area (see Photo 4 in Appendix B) include grasses, subshrubs, and forbs such as purple three-awn (*Aristida purpurea*), fountaingrass (*Pennisetum setaceum*), deergrass (*Muhlenbergia rigens*), sweetbush (*Bebbia juncea*), canyon ragweed (*Ambrosia ambrosioides*), trailing four-o'clock (*Allionia incarnata*), and rattlesnake weed (*Euphorbia albomarginata*), and weedy species including wild oats (*Avena fatua*), red brome (*Bromus rubens*), and needle grama (*Bouteloua aristidoides*). One noxious weed species, buffelgrass (*Pennisetum ciliare*), was observed in several locations near the western end of the project area.

Vegetation along the shoreline of Canyon Lake consists mostly of cat-claw acacia, foothills paloverde, and velvet mesquite trees interspersed with buttonbush (*Cephalanthus occidentalis*) and the occasional Fremont cottonwood (*Populus fremontii*) and Goodding's willow (*Salix gooddingii*) trees. Riparian habitats are generally limited because the steepness and rockiness of the canyon slopes provides little room for riparian habitat and saturated soils at the lake's edge.

Small areas of wetlands are present within the project limits at Tortilla Creek (see Photos 36–38 in Appendix B). The downstream side of the ford has a series of small, intermittent pools in bedrock that are vegetated with giant reed (*Arundo donax*), cattail (*Typha* sp.), saltcedar (*Tamarix* sp.), Fremont cottonwood, buttonbush, and Bermudagrass (*Cynodon dactylon*). Upstream of the ford, the ground elevation is higher and the soil is generally drier than the area downstream of the ford (depending on the season). Alkali heliotrope (*Heliotropium curassavicum*) and Bermudagrass form a dense ground cover across this upstream area along with scattered individuals of giant reed, buttonbush, Goodding's willow, and common cocklebur (*Xanthium strumarium*).

The First Water Creek Bridge (Structure No. 26) and the Boulder Canyon Bridge (Structure No. 193) were inspected for the presence of bats and nesting birds during a site visit on August 26, 2014. They are both steel truss-type bridges with open beam structures that generally do not provide any day-roosting habitat for bats (see Photos 21 and 28 in Appendix B). Several cliff swallow nests were observed on the underside of the Boulder Canyon Bridge, while no bird nests were observed at the First Water Creek Bridge.

4. Species Identification

The US Fish and Wildlife Service's (USFWS) Information, Planning, and Conservation (IPaC) decision support system was accessed to obtain an official species list for the project area on July 29, 2015 (Consultation Tracking Number 2EAAZ00-2014-SLI-0555; see Appendix C). This species list was reviewed by a qualified biologist (Ian Tackett, Logan Simpson) to determine if any of these special status species have the potential to occur in the project area; the TNF also identified a list of sensitive species to address in this Biological Evaluation. Table 3 lists the species that are analyzed in detail within this document. Special status species included on the USFWS lists, but excluded from further evaluation, are addressed in Table 4. This project, and the associated SWPPP, would have no effect on the species listed in Table 4. There are no critical habitats that have been designated or proposed under the Endangered Species Act (ESA; 16 U.S.C. 1531–1544, as amended) in the project area; therefore, no critical habitats would be impacted by this project.

Table 3. Species evaluated in detail

Common Name	Scientific Name	Status ^a
Threatened, Endangered, Proposed, and Candidate Species		
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	ESA LE
Sonoran desert tortoise	<i>Gopherus morafkai</i>	ESA C USFS S
Bald and Golden Eagle Protection Act		
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA USFS S
USFS Sensitive Species		
Lowland leopard frog	<i>Lithobates yavapaiensis</i>	USFS S
Mapleleaf false snapdragon	<i>Mabrya [=Maurandya] acerifolia</i>	USFS S
Pima Indian mallow	<i>Abutilon parishii</i>	USFS S

Source: US Fish and Wildlife Service Information, Planning, and Conservation (IPaC) decision support system, <<http://ecos.fws.gov/ipac/>>, accessed July 29, 2015.

^a Status definitions: BGEPA=Bald and Golden Eagle Protection Act, C=Candidate, ESA=Endangered Species Act, LE=Listed Endangered, S=Sensitive, USFS=US Forest Service

Table 4. Species excluded from evaluation and justification for their exclusion

Species Name	Status ^a	Habitat Requirements	Exclusion Justification
Fish			
Roundtail chub (<i>Gila robusta</i>)	ESA C USFS S	Cool to warm waters of rivers and streams from 1,000 to 7,500 feet, often occupying the deepest pools and eddies of large streams.	Project area is outside this species' known current distribution

Table 4. Species excluded from evaluation and justification for their exclusion (continued)

Species Name	Status ^a	Habitat Requirements	Exclusion Justification
Birds (continued)			
California least tern (<i>Sterna antillarum browni</i>)	ESA LE	Open, bare or sparsely vegetated sand, sandbars, gravel pits, or exposed flats along shorelines of inland rivers, lakes, reservoirs, or drainage systems below 2,000 feet. Breeding documented in Maricopa County, Arizona; migrants may occur more frequently.	Project area is outside this species known breeding distribution
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	ESA LT	Statewide in mature montane forest and woodland, old growth mixed-conifer, and pine-oak forests on steep slopes and canyons from 4,100 to 9,000 feet.	No suitable habitat present – there are no montane forest or woodland, old-growth mixed-conifer forest, or pine-oak forest habitats in the project area
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	ESA LE	Dense cottonwood-willow and tamarisk vegetation communities along rivers and streams below 8,500 feet.	No suitable breeding habitat present – there is no dense cottonwood-willow or tamarisk vegetation in the project area
Sprague's pipit (<i>Anthus spragueii</i>)	ESA C	Native grasslands with vegetation of intermediate height and lacking woody shrubs below 5,000 feet. Cultivated, dry Bermuda grass and alfalfa fields mixed with patches of dry grass, or fallow fields appear to support the species during wintering. There are no breeding records in Arizona.	No suitable (i.e., native grassland or cultivated grass field) habitat present
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	ESA LT	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) below 6,500 feet.	No suitable breeding habitat present – there is no dense cottonwood-willow or other multi-layered riparian vegetation in the project area
Mammals			
Lesser long-nosed bat (<i>Leptonycteris curasoae yerbabuenae</i>)	ESA LE	Desert grassland and scrubland up to oak transition areas with columnar cacti or agave below 6,000 feet.	No suitable roosting habitat present

Source: US Fish and Wildlife Service Information, Planning, and Conservation (IPaC) decision support system, <<http://ecos.fws.gov/ipac/>>, accessed July 29, 2015.

^a Status Definitions: BGEPA=Bald and Golden Eagle Protection Act, C=Candidate, ESA=Endangered Species Act, LE=Listed Endangered, LT=Listed Threatened, S=Sensitive, USFS=US Forest Service

5. Species Evaluation - Threatened, Endangered, Proposed, and Candidate Species

Gila Topminnow

Endangered Species Act Status:	Endangered, 1967
Critical Habitat:	None designated
Determination:	May affect, likely to adversely affect

Life History Information

The Gila topminnow (*Poeciliopsis occidentalis occidentalis*), a small live-bearing fish in the minnow family (Poeciliidae), is one of two subspecies of Sonoran topminnow (*Poeciliopsis occidentalis*) occurring in Arizona. Its caudal fin is almost square; its body is somewhat elongated, tan to olivaceous in color, darker above, and often white on the belly, with a dark lateral band along its sides. The Gila topminnow is a sexually dimorphic species with males rarely reaching more than 1 inch in length and females reaching lengths of 1.2–2 inches. Breeding males may become blackened in color with some orange coloration at the base of the gonopodium and the base of the dorsal fin (Minckley 1973).

The Gila topminnow is considered to have once been the most common fish in the Gila River Basin in Arizona, and its range also extended into Mexico and New Mexico (Minckley 1973). The species was historically found in most perennial springs and streams, and along the vegetated margins of rivers within the Gila River drainage in Yavapai, Gila, Pinal, Maricopa, Graham, Greenlee, Cochise, Pima, Santa Cruz and Yuma Counties (AGFD 2001). By 1994, the Gila topminnow was restricted to 10 known populations in widely separated, isolated locations (Weedman and Young 1997). According to the AGFD (2001), disjunct populations currently exist in 9–11 natural locations, 22–24 reintroduced locations within the Gila River drainage, and one location in the Bill Williams River drainage. Of these localities, 15 are springs while the remaining localities are creeks and washes. According to the USFWS (2008), the species has been released at almost 200 locations in efforts to reestablish populations; however, the Gila topminnow reintroduction program has had limited success, with the majority of populations disappearing almost immediately, or surviving only for a few years. The Gila topminnow is currently extant in Arizona and Mexico; most of the remaining native populations in Arizona occur in the Santa Cruz River system (USFWS 2008).

Gila topminnows are relatively short-lived, with a life span of approximately 1 year. Females bear live young, typically from 10–15 per brood, and may carry two broods simultaneously. The reproductive season normally lasts from April through November, although young may be produced year-round in some thermally stable springs; young produced early in the breeding season may reach sexual maturity in a few weeks to several months. This omnivorous fish has a wide-ranging diet consisting of bottom debris,

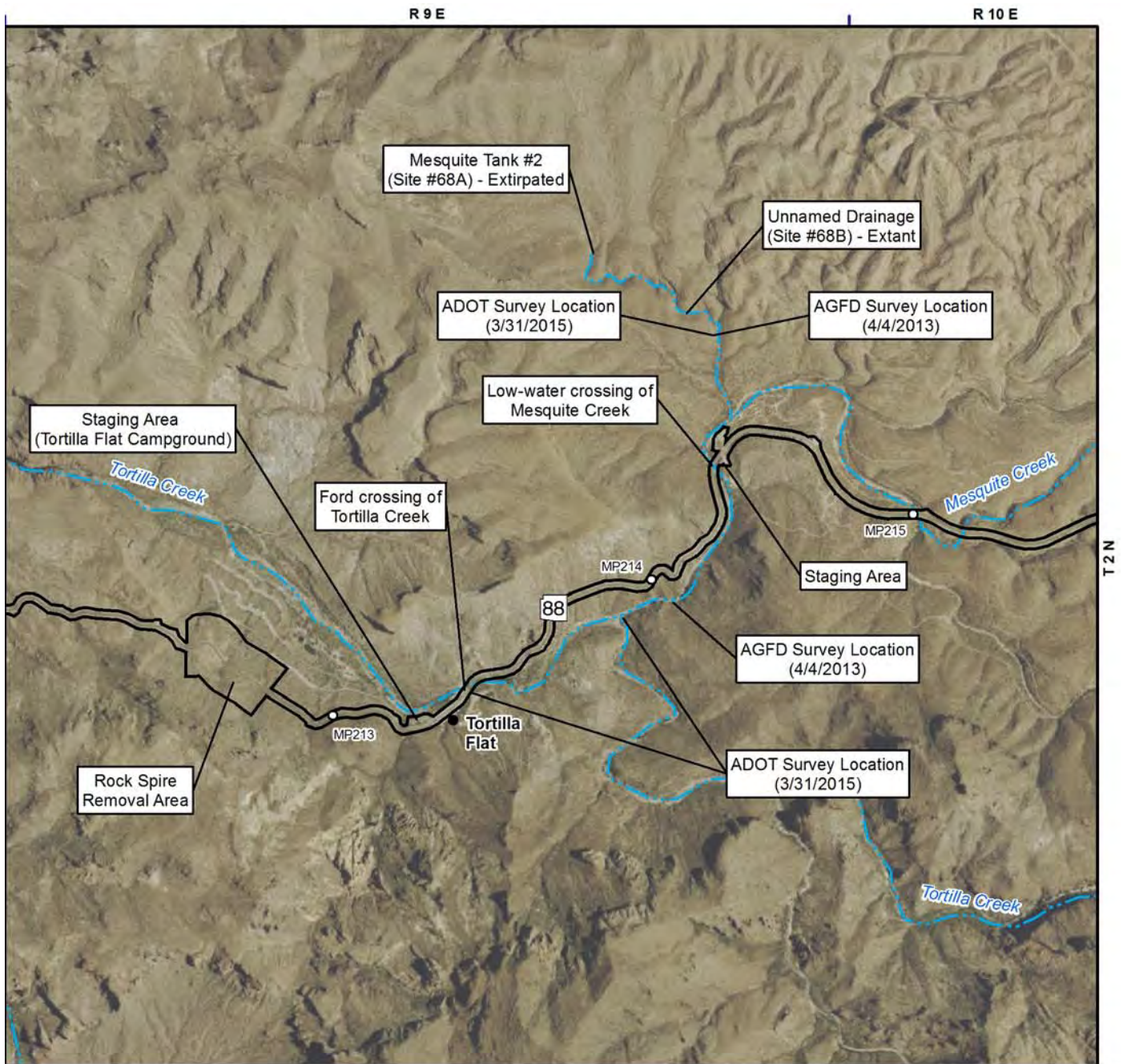
vegetative debris, and small crustaceans, and will also feed on aquatic insect larvae (AGFD 2001).

The significant reductions in the distribution and abundance of the Gila topminnow are attributed to predation by, and competition with, nonnative fish including the mosquitofish (*Gambusia affinis*), as well as declines resulting from a host of land uses that have dewatered and degraded the species' habitats (Minckley 1973; Weedman and Young 1997; Voeltz and Bettaso 2003; USFWS 2008). The mosquitofish was introduced in the early 1900s; this species utilizes the same habitat as the Gila topminnow and is aggressive and predatory, preying on young topminnows and harassing the adults, which can damage their fins, leading to stress, bacterial infection, and eventually death. Minckley (1973) noted that displacement or destruction of Gila topminnows by mosquitofish can occur in a single season.

The Sonoran topminnow was first declared endangered within the U.S. portion of its range in 1967 under the Endangered Species Preservation Act (USFWS 1967), a precursor to the current Endangered Species Act. No critical habitat was designated at the time of the listing. Minckley (1973) later recognized two subspecies of Sonoran topminnow, the Gila topminnow and Yaqui topminnow (*Poeciliopsis occidentalis occidentalis*). Both subspecies are recognized as endangered species under the original listing by the USFWS. A recovery plan was approved in 1984 (USFWS 1984); a revised recovery plan was drafted in 1998, but has not been approved yet (Weedman 1998). The interim goal for recovery of the Gila topminnow is ensuring its survival through protection of habitats currently occupied by natural populations and maintenance of refugia stocks of each natural population (Weedman 1998).

Survey History

One thousand Gila topminnows from Boyce Thompson Arboretum were stocked into Mesquite Tank #2, a dirt tank located in an unnamed drainage approximately 4,500 feet upstream of the SR 88 crossing, in 1982 (Voeltz and Bettaso 2003; see Figure 5). Subsequent to the stocking, the unauthorized opening of a drain valve in the bottom of the concrete dam at the lower end of the tank resulted in the downstream dispersal of Gila topminnows and the drying of the tank. Gila topminnows have subsequently been netted in the unnamed drainage downstream of the tank (Site #68B – refer to Figure 5) from 1985 through 2003 (Voeltz and Bettaso 2003). According to the AGFD, Gila topminnows have been documented in Tortilla Creek immediately adjacent to SR 88 (see the AGFD's scoping response in Appendix E). Surveys conducted by the AGFD at two locations in April 2013 documented Gila topminnows approximately 1,900 feet upstream of SR 88 at Site #68B, and in Mesquite Creek just upstream of its confluence with Tortilla Creek, approximately 3,000 feet upstream of the Tortilla Creek ford crossing (refer to Figure 5) (K. Kessler, TNF, pers. comm. 2014).



Source: Arizona Transportation Information System GIS Coverage (2013)

Key

Project Area

Miles
0 0.5



Figure 5. Gila topminnow reintroduction and survey locations

Biologists with the AGFD, ADOT, and USFWS conducted surveys to determine the current distribution of Gila topminnows in Mesquite and Tortilla creeks on March 31, 2015. Survey methods included the use of seines, dipnets, minnow traps, and a backpack electrofishing unit. Gila topminnows were found to be present in each of the stream segments that were surveyed, which included Site #68B (located in an unnamed drainage upstream of its confluence with Mesquite Creek) and Tortilla Creek from its confluence with Mesquite Creek downstream to just below the ford crossing (refer to Figure 5).

Habitat Evaluation and Suitability

Gila topminnows prefer quiet, warm waters with a slow current, such as shallow margins of main river channels, backwaters, springs, wells, or tributaries that are close to or adjoining larger rivers (Weedman and Young 1997). The species historically concentrated in shallows, especially where vegetation or debris was present, with adults tending to congregate in areas of moderate current, below riffles and along the margins of flowing streams in accumulated algae mats (Minckley 1973). Gila topminnows can withstand a fairly wide range of water temperatures and chemistries (AGFD 2001).

There are typically surface flows present in Mesquite and Tortilla creeks only during parts of the year dependent on local and upstream rain events (summer and winter/spring rains); however, subsurface flows appear to be sufficient to sustain small bedrock-constrained pools with water throughout the year in some locations, even when no surface flows are present. The persistence of the Gila topminnow in the project area suggests that the species is able to reliably find adequate refuge during drier periods and take advantage of more suitable conditions, when present, to reproduce and maintain the population.

While the distribution of Gila topminnows in Mesquite and Tortilla creeks may be reduced during dry periods when there is less surface water available, there is the potential for Gila topminnows to be redistributed within these drainages during storm events that may occur prior to or during construction. Given the dynamic nature of flow events in desert streams and the reproductive capabilities of the Gila topminnow, it is assumed that the species could potentially be found anywhere surface water is present along Mesquite and Tortilla creeks in the project vicinity, though it may not be able to persist in the lowest reaches of Tortilla Creek where nonnative fish from Canyon Lake are able to access the drainage. Therefore, it is assumed that Gila topminnows could be present in pools or stream flow within the project limits at the time when construction is planned to occur.

Analysis and Determination of Effects

Direct Effects: The proposed work would occur at two locations where Gila topminnows could be present: the concrete ford crossing of Tortilla Creek (MP 213.3) and the low-water crossing of Mesquite Creek

(MP 214.37). Work at both locations would be planned to occur during the months of April–June, when surface flows are expected to be lowest, for ease of construction and to prevent potential impacts to water quality. However, there tends to be a persistent pool of water in the bedrock-constrained area immediately downstream of the Tortilla Creek ford crossing (potentially due to subsurface flows in Tortilla Creek), and any storm event that results in surface flows in Tortilla or Mesquite creeks could also result in surface water entering the work area at either location. For these reasons, ADOT is planning to dewater the work area at the Tortilla Creek ford crossing prior to construction and maintain the dewatered area throughout the construction period at the ford crossing (i.e., for approximately 6 weeks).

Dewatering of the work area at the Tortilla Creek ford crossing is expected to be accomplished by constructing a berm or other temporary barrier upstream of the ford crossing, and pumping the retained water across the road and into the creek downstream of the ford crossing. Water that is pumped from behind the temporary barrier would be treated (i.e., sediments would either be filtered or allowed to settle out) prior to being discharged into the stream channel below the ford crossing. The discharge of this water would occur in such a manner as to not cause erosion of the stream channel.

Dewatering activities would generally preclude up- or downstream movement of fish during the 6 week construction period due to the presence of block netting if surface water flows occur. Dewatering and ford reconstruction activities would occur during the months of April–June, which would overlap with the reproductive season for Gila topminnows. As a result, there may be direct impacts to young fish as well as adults. The pump(s) used for dewatering would be fitted with fish screens (i.e., mesh screens 0.25 inches or smaller) to minimize impacts associated with the dewatering activities.

Gila topminnows have been extant in the project vicinity since they were reintroduced in Mesquite Tank #2 in 1982 and were recently documented at the Tortilla Creek ford crossing during surveys conducted on March 31, 2015, so there is a high potential for Gila topminnows (adults and/or young) to be present within the project limits (or immediately up- or downstream of the project limits) during construction. Therefore, a biological monitor would conduct a preconstruction survey, install block nets, and relocate any Gila topminnows that are present within the work area immediately prior to construction. Block nets would remain in place and be monitored until the work area is isolated from surface water flows. ADOT would coordinate with the USFWS and AGFD to develop a more specific fish and native frog exclusion protocol and relocation plan for Gila topminnow prior to completion of the USFWS's Biological Opinion.

No work would begin at the Tortilla Creek ford crossing or the low-water crossing of Mesquite Creek prior to the completion of the fish removal activities at each location. If a flow of surface water into the work area occurs, work would be stopped in that area until the fish removal procedure was completed.

It should be noted that the fish removal activities may not be 100 percent effective due to the small size of the Gila topminnow (particularly young fish) and the potential for fish to hide in underbank areas or interstitial spaces and be missed during the removal activities. Efforts would be made to relocate all fish from within the project limits. There is also the potential for fish to be injured, stressed, or killed during relocation, though specific protocols for fish relocation would be identified through coordination with the AGFD and USFWS to reduce the possibility of harm to fish that are relocated. ADOT would utilize qualified biologists with the necessary state and federal permit(s) to conduct the preconstruction fish removal activities to ensure the success of the relocation effort.

The sequence of construction at the ford crossing would consist of: (1) mobilization – delivering equipment and setting up contractor use areas; (2) site preparation – milling asphalt from the top of the ford, dewatering the work area, excavating and removing the southern half of the ford crossing, clearing rubble from the existing 18-inch steel culvert; (3) construction – installing a 15-inch steel liner in the existing culvert and grouting the annulus with non-shrinking grout, repairing cracks and spalls, installing formwork and steel reinforcement, placing wet concrete, removing formwork, sealing concrete surfaces with methacrylate, placing backfill; and (4) demobilization – removing excess/unused construction material, restoring the site, and removing equipment. The work at the ford crossing would be planned to occur during dry conditions (to the extent practicable), and would take approximately 6 weeks to complete. Figure 4 shows the anticipated area of disturbance required for reconstruction of the Tortilla Creek ford crossing.

The sequence of construction during application of the double seal coat at the low-water crossing of Mesquite Creek would consist of: (1) application of the bituminous material for the chip seal; (2) spreading and compaction of the cover material (i.e., clean sand, gravel or crushed rock); (3) curing period; (4) brooming of excess cover material; (5) application of the bituminous material for a fog coat; and (6) spreading of the blotter material. The application of the double seal coat must occur when the pavement surface is dry, per ADOT's Standard Specifications. Curing of the newly-applied chip seal coat such that it is not able to be washed away and can be driven on occurs within hours of its application. Curing is complete within approximately 30–60 days.

Materials that would be used during reconstruction of the ford crossing and during roadway sealing at the low-water crossing of Mesquite Creek could adversely affect water quality and could potentially harm or kill fish or other aquatic organisms that are present. These include cast-in-place concrete, concrete curing agents, non-shrinking grout (which typically contains Portland cement), methacrylate concrete sealer, and bituminous material (asphalt emulsions) used for road sealing. In addition to best management practices and water quality protections required by Clean Water Act and AZPDES permits, ADOT's Standard Specifications for protection of the environment would be implemented as part of the proposed action to

prevent stormwater runoff and minimize the likelihood of hazardous materials spills, to minimize the project footprint, to avoid sensitive areas shown on the plans, and to restore areas that are impacted during construction. Concentrations of pollutants that could result in adverse effects, including mortality to aquatic organisms, are more likely during and immediately after construction, with effects decreasing the farther in distance from the project site and in time from construction. Under optimal (i.e., dry) conditions, any impacts to water quality are likely to be minimal or nonexistent; however, an unforeseen large storm event that results in surface flows through the active construction area could potentially result in contact with materials such as uncured concrete or asphalt emulsions (i.e., paving/seal coating materials). ADOT requires contractors to develop and submit specific plans for the storage and use of particularly hazardous materials such as methacrylate, which would minimize the potential for spills or inappropriate use/application of these materials.

The effects of concrete leaching into surface waters that are inhabited by Gila topminnows and other aquatic organisms have been identified as a specific concern for this project. During the concrete curing and drying process, highly alkaline pore water comes to the surface of concrete and can result in a spike in the pH of surface water that comes into contact with the concrete surface. ADOT would address the potential impacts associated with exposure of surface waters to freshly-poured or recently-cured concrete by 1) preventing the initial exposure to surface waters by conducting the ford reconstruction within a dry/dewatered work area and 2) sealing the cured concrete with methacrylate sealer that would be allowed to dry and form a barrier before surface waters come into contact with the ford. The duration of time that the concrete would require to cure is subject to the approval of the Phoenix District Resident Engineer. The curing time depends on the concrete mix (which will be approved in advance by the Phoenix District Resident Engineer), but it is expected that the concrete would need to cure for approximately 7 days to meet ADOT's specification of 90 percent of final compressive strength. Methacrylate has been shown to provide effective protection from concrete leaching and to buffer the increase in pH that results when water is exposed to concrete to a level that is safe for aquatic organisms (see Law and Setunge 2014). The methacrylate sealer dries quickly (within 2 to 4 hours), so there is not a prolonged period where there could be a potential exposure to the wet methacrylate sealer. These measures would be used to protect water quality and aquatic organisms in Tortilla Creek during the ford reconstruction.

Indirect Effects: Indirect effects are those effects that are caused by or would result from the proposed action and are later in time, but are still reasonably certain to occur. The planned improvements along SR 88 in the project area would not cause an increase in development, recreational use, or any other use that would degrade suitable habitat for the Gila topminnow in the project vicinity. As mentioned above, there is the potential for compounds that are released while the cast-in-place concrete is curing to enter the

drainage (e.g., during a large storm event that results in surface flows that overtop the berm placed for dewatering purposes), and adversely impact water quality downstream from the crossing. However, work at the ford crossing would be scheduled to occur April–June (when surface flows are minimal or nonexistent), and dewatering and stormwater pollution prevention measures would be designed to address expected normal storm events that may occur during the construction period at the ford crossing. There may be a temporary increase in erosive potential and sediment transport following the completion of the project, until such time that vegetation is reestablished at the ford crossing. In addition to implementation of a SWPPP for erosion control, ADOT would minimize the potential adverse effects due to exposed soils by confining construction-related disturbance to the minimum area necessary to complete the project.

Cumulative Effects: Cumulative effects are those effects of future non-federal actions (i.e., state, local government, tribal, and private actions) that are reasonably certain to occur in the project area. Lands in the project vicinity consist of public lands that are managed by the TNF. Future federal actions unrelated to the proposed action would be subject to individual ESA consultation requirements established in Section 7 of the ESA and, therefore, are not considered as cumulative to the proposed project.

Determination: The project-specific mitigation measures that would be implemented for the protection of Gila topminnows are listed below in Section 8 – Mitigation Measures. While a range of best management practices and mitigation measures would be implemented by ADOT and its contractor to minimize the potential adverse effects to Gila topminnows and other aquatic organisms during construction of the proposed improvements along SR 88, Gila topminnows may be injured or killed as a result of fish relocation or construction activities. Therefore, the proposed project may affect the Gila topminnow, and is likely to adversely affect the Gila topminnow or its habitat.

Sonoran Desert Tortoise

Endangered Species Act Status:	Candidate, 2010
TNF Status:	Sensitive
Critical Habitat:	None designated
Determination:	May impact individuals, but is not likely to result in a trend toward loss of viability

Life History Information

The adult Sonoran desert tortoise (*Gopherus morafkai*) is fairly large (8–15 inches in length), with a high-domed brownish carapace and yellowish unhinged plastron, short tail, and stocky limbs. Both the carapace and plastron exhibit prominent growth lines, and the forelimbs are covered with large conical scales. Sonoran desert tortoises tend to be more pear-shaped and have a flatter carapace than the more oval-

shaped Mojave population (AGFD 2010).

Two genetically and morphologically distinct populations of desert tortoise are found in Arizona. The Mojave desert tortoise occurs west and north of the Colorado River and is listed as threatened under the ESA, whereas the Sonoran desert tortoise occurs east and south of the Colorado River and is currently a candidate for ESA listing.

Sonoran desert tortoises typically inhabit bajadas and rocky slopes associated with Mojave desertscrub, Sonoran desertscrub, semidesert grassland, and chaparral vegetation communities. Elevations in these communities range from approximately 500 feet in Mojave desertscrub to 5,300 feet in chaparral communities. In Sonoran desertscrub, desert tortoises occur most often in the palo verde-mixed cacti association in areas with boulders and rock outcrops. These formations offer shelter sites, an important component and limiting factor of desert tortoise habitat. Most often, tortoises will excavate shallow burrows in deeper soils at the base of boulders and rock outcrops; however, caliche caves and the incised, undercut banks of washes are also important shelter sites. Desert tortoises may also rest directly under live or dead vegetation without constructing a burrow, particularly on warm summer nights (AGFD 2010; Arizona Interagency Desert Tortoise Team [AIDTT] 1996).

The activity period of Sonoran desert tortoises is variable between individuals and discrete populations. The active period begins when temperatures warm in February and March, decreasing during the arid foresummer and peaking with the summer monsoons. Sonoran desert tortoises brumate (i.e., become dormant to overwinter) at burrow sites similar to those used the rest of the year with the onset of cool temperatures in November.

Sonoran desert tortoises typically mate in spring and early summer. Once mated, females dig a nest hole in the soil and lay 1–13 eggs, and are capable of laying fertile eggs for up to 4 years or more. After the eggs are deposited, the female fills in the nest hole and may defend the site for some time against potential predators; however, the female does not care for the hatchlings (AGFD 2010).

Sonoran desert tortoises are herbivorous and consume a variety of annual and perennial grasses, forbs, and succulents (AGFD 2010). Arthropods, bones, soil, and feces of vertebrates (including that of other tortoises) have also been documented as being consumed by tortoises (AIDTT 1996).

The Sonoran desert tortoise was petitioned for federal listing under the ESA in 2008. In 2010, the USFWS determined that listing the Sonoran desert tortoise was warranted, but was precluded by higher priority actions (USFWS 2010). Therefore, the Sonoran desert tortoise is currently a candidate for listing under the ESA. This species is also managed as a sensitive species by the TNF. Per a settlement agreement

resulting from a lawsuit against the USFWS, there is a court-mandated requirement for the USFWS to determine whether to publish a proposal to list the Sonoran desert tortoise under the ESA by September 30, 2015. Threats to the Sonoran desert tortoise include nonnative plant species invasions and altered fire regimes; urban and agricultural development; barriers to dispersal and genetic exchange; off-highway vehicles; roads and highways; historical ironwood and mesquite harvest in Mexico; improper livestock grazing (predominantly in Mexico); human immigration and interdiction activities; illegal collection; predation from feral dogs; human predation and vandalism; drought; and climate change (USFWS 2014).

Survey History

Sonoran desert tortoises have been documented as occurring within 3 miles of the project area by the AGFD (see the AGFD's scoping response in Appendix E). The AGFD's Heritage Database Management System (HDMS) has records within 1 mile of MP 210–212 (south side of SR 88); 0.3 miles east of SR 88 south of Canyon Lake, between SR 88 and First Water Creek (dead individual found 2/2012); 0.3 mile south of SR 88 south of the picnic grounds at the east end of Canyon Lake (live individual found 9/13/2014); and 0.14 mile north of SR 88 to the northeast of Tortilla Flat (between Mesquite Flat and Tortilla Flat, 10/4/1991).

Tortoise/burrow surveys were previously conducted by ADOT in five of the six curve reconstruction areas (i.e., curves 2–6) in March 2013 as part of a prior geotechnical investigation in the project area. No tortoises, tortoise sign, or tortoise burrows were observed in those areas during the surveys, though suitable foraging habitat is present, and areas of rock outcrop that could potentially be used by tortoises as shelter sites were observed in the vicinity of the surveyed areas (Logan Simpson Design Inc. 2013).

The access route and potential work area associated with the rock spire removal that is planned as part of this project were surveyed during a site visit on August 26, 2014. As with the curve reconstruction areas, no tortoises or burrows were observed within the potential disturbance areas associated with the rock spire removal, but there are rocky slopes and rock outcrop areas within the potential disturbance areas and nearby that are likely occupied by tortoises.

Habitat Evaluation and Suitability

The Sonoran desert tortoise occurs primarily on rocky slopes and bajadas in Sonoran desertscrub and adjacent vegetation communities throughout central, southern, and western Arizona. While boulder-covered slopes are the preferred habitat of the Sonoran desert tortoise, tortoises may also be present in low densities on lower mountain bajadas and along washes when suitable shelter sites are present (Grandmaison et al. 2010).

Suitable habitat for Sonoran desert tortoises is present throughout the project area and in adjacent lands, and desert tortoises could potentially be encountered anywhere in the project area given the proximity of SR 88 to prime tortoise habitats. Tortoise burrows/shelter sites are not expected to be present along the road shoulder where most of the project work is planned to occur due to the extent of ongoing disturbance and vehicle travel in those areas; however, potential shelter sites for Sonoran desert tortoises are likely to occur further away from the roadway in the immediate project vicinity where rocky, boulder-covered slopes and native desert scrub vegetation are present.

Analysis and Determination of Effects

Direct Effects: Construction activities, specifically the earthwork that is required to reconstruct curves at six locations within the project limits, would result in the loss of vegetation from approximately 2 acres of potential foraging habitat for the Sonoran desert tortoise; approximately 15 additional acres of disturbance would occur mainly as a result of the installation of the pavement safety edge, which would take place within 3 feet of the existing road edge from MP 203.40 and MP 213.35, and shoulder stabilization, which would take place as needed throughout the project area (see Table 1 and Figure 2). Also, as previously mentioned, Sonoran desert tortoises could potentially be encountered within the project limits during construction due to the presence of their preferred habitat (i.e., rocky slopes) throughout the project area.

ADOT has identified project-specific measures that would be implemented as part of the proposed action to ensure the safety of any tortoise that is encountered over the course of the project. A qualified biologist would conduct preconstruction surveys of the curve reconstruction areas and the rock spire removal area within 48 hours prior to construction activities in each area to locate any tortoises/burrows that may be present. ADOT has also committed to having a biological monitor present during the initial vegetation clearing phase in each of the curve reconstruction areas and at the Tortilla Creek ford crossing, as well as during the rock spire removal, and any Sonoran desert tortoises that are found would be relocated according to the most current guidance or protected in place.

Prior to the commencement of any construction activities, ADOT would provide information to the construction contractor and all on-site workers regarding Sonoran desert tortoises and the specific measures that would be implemented for the protection of desert tortoises and other wildlife. The contractor would be required to take any measures necessary to ensure that project activities would not harm or disturb any desert tortoise, and to notify ADOT if a desert tortoise is encountered during construction. While desert tortoises would be relatively easy to spot on the SR 88 roadway where most of the heavy construction equipment would be operating, there is some potential for tortoises to find shelter underneath parked vehicles or equipment, go unnoticed by construction workers, and get run over when the vehicle or

equipment is moved. Therefore, on-site workers would be required to check under parked vehicles and construction equipment prior to driving to make sure there isn't a tortoise sheltering underneath. If a desert tortoise is found sheltering underneath a parked vehicle, the tortoise would either be allowed to move out from under the vehicle on its own before the vehicle/equipment is moved or would be relocated per the current guidelines for Sonoran desert tortoise handling (e.g., AGFD's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects*).

With the implementation of these measures by ADOT and the contractor, direct effects to individual Sonoran desert tortoises are expected to be limited to the minor loss of foraging habitat, potential displacement from active construction areas, and harassment resulting from handling individual tortoises during relocation.

Indirect Effects: Indirect effects are those effects that are caused by or would result from the proposed action and are later in time, but are still reasonably certain to occur. The proposed project consists of preservation of the existing roadway with additional safety improvements. These activities would not change the baseline conditions for Sonoran desert tortoises in the project area. The project would not result in potential indirect impacts commonly considered for roadway construction projects, such as habitat loss caused by facilitation of private development, increased mortality from increased traffic volumes, habitat degradation as a result of increased use, or other indirect impacts. Therefore, no indirect effects are anticipated.

Summary: The planned improvements along SR 88 would result in the direct loss of potential foraging habitat for the Sonoran desert tortoise; however, the amount of potential foraging habitat that would be affected or lost is minimal. While there are also potential direct effects associated with planned construction activities, ADOT is planning on implementing various mitigation measures to address potential impacts to Sonoran desert tortoises during construction (see Section 8 – Mitigation Measures). Therefore, the proposed project may impact individuals of Sonoran desert tortoise, but is not likely to result in a trend toward loss of viability.

6. Species Evaluation – Bald and Golden Eagle Protection Act

Bald Eagle

Endangered Species Act Status:	Delisted
TNF Status:	Sensitive
Critical Habitat:	None designated
Determination:	No impact

Life History Information

The bald eagle (*Haliaeetus leucocephalus*) is among the largest of the North American raptors, with adults reaching a total length of 27–35 inches, a wingspan of 71–89 inches, and a weight of 4.4–13.6 pounds. In Arizona, adult males average 7.3 pounds and females average 9.7 pounds. The head, neck, and tail of adult birds are white, whereas the body, flight feathers, and wing coverts are dark brown (AGFD 2011; Hunt 1998).

The range of the bald eagle includes much of North America, mainly the United States and Canada. Bald eagles are resident year-round in central Arizona; wintering eagles from populations that breed farther north also occur seasonally in central and northern Arizona. Foraging habitat for bald eagles includes rivers and reservoirs, particularly the shallow, fast water of riffles that attract spawning and foraging fish (Hunt 1998). Roosting and perching habitat for bald eagles consists of four types of perches: guard/sentry perches that are located in tall trees or on cliffs where the nest can be observed, foraging perches that are usually adjacent to or overhanging a lake or river, shade perches in arid regions that provide cover during warm periods, and roost perches that are typically used at night to rest and that provide shelter from the elements and an unobstructed view of the nest (AGFD 2011).

The bald eagle is known to breed from the lower desert (1,100 feet) to higher-elevation woodlands around 7,900 feet, with the majority of breeding sites occurring along the Salt and Verde rivers in the central part of the state. Breeding also occurs along the Gila, Bill Williams, Agua Fria, and Little Colorado rivers. Nesting sites usually occur along lakes and rivers; however, in Arizona, even though water is usually nearby, nests are often in open desert. Nests are typically built within sight of water but, in rare instances, can be found some distance away. Nest sites include living and dead trees, cliffs, and pinnacles. Bald eagle nests are composed of sticks and branches from a variety of plant species and lined with grasses and cactus fibers and can be very large, encompassing an area greater than 65 square feet and weighing over a ton (AGFD 2011; Hunt 1998).

Bald eagles begin breeding at 4 years of age or older and form lifelong pair bonds. Breeding activities can

begin as early as December, but most often occur during January or February. One to three eggs are laid and are incubated by both parents. Fledglings begin flapping their wings between 10 and 12 weeks of age and quickly become strong fliers (AGFD 2011; Hunt 1998).

The diet of bald eagles consists mainly of fish, with mammals and birds composing a minor portion. In Arizona, bald eagles prey on fish such as common carp, catfish, native suckers, black crappie, and bass. Mammals, including jackrabbits and cottontails, and water birds, especially American coots and eared grebes, are important parts of the bald eagle's winter diet, along with occasional road kills (AGFD 2011; Hunt 1998).

The bald eagle was federally-listed as endangered in 1967 and reclassified as threatened in 1995. The decline of the bald eagle was largely attributed to the use of dichloro-diphenyl-trichloroethane (DDT), initially used to control mosquitoes in coastal and wetland areas and later used as a general insecticide. It was determined that DDT interfered with eggshell production, which led to reproductive failure in bald eagles. DDT was banned from use in the United States in 1972, which has aided in the recovery of bald eagle populations. In 1970, only 2 pairs of bald eagles were known to exist in Arizona, but since then numbers have increased to about 49 breeding pairs. Today, a major factor affecting the status of bald eagles is disturbance during nesting. If adults are flushed from the nest when eggs or young are present, especially during inclement weather or when predators are nearby, the nest may fail. Many of the areas surrounding nests in Arizona are closed from public use during the breeding season to prevent this from occurring, though no closures have been implemented to protect the nest located at Canyon Lake. In 2007, the USFWS published their *National Bald Eagle Management Guidelines*, which provide recommendations for avoiding disturbance at bald eagle nest sites and avoiding impacts from planned activities in bald eagle use areas (USFWS 2007). The AGFD has also published the *Conservation Assessment and Strategy for the Bald Eagle in Arizona* (Driscoll et al. 2006), which also provides guidelines to protect Arizona's bald eagle breeding areas from adverse effects.

The USFWS proposed to delist the bald eagle in 1999; on July 9, 2007, the USFWS removed all bald eagles in the lower 48 states from the List of Endangered and Threatened Wildlife due to its recovery over the past 30 years. Subsequent litigation led to the desert nesting population of bald eagle being returned to its listed status while the USFWS conducted a status review to determine whether listing the desert nesting bald eagle population as a distinct population segment (DPS) was warranted. The USFWS ultimately determined that the bald eagles nesting in the Sonoran Desert Area of central Arizona did not qualify as a DPS and were therefore not a listable entity under the Endangered Species Act, and further concluded that listing would not be warranted even if the population met the DPS criteria. The bald eagle is, therefore, no longer listed under the Endangered Species Act; however, the bald eagle is still protected under the Bald

and Golden Eagle Protection Act (16 U.S.C. 668) and the Migratory Bird Treaty Act (16 U.S.C. 703–711). The bald eagle is also managed as a sensitive species by the TNF.

Survey History

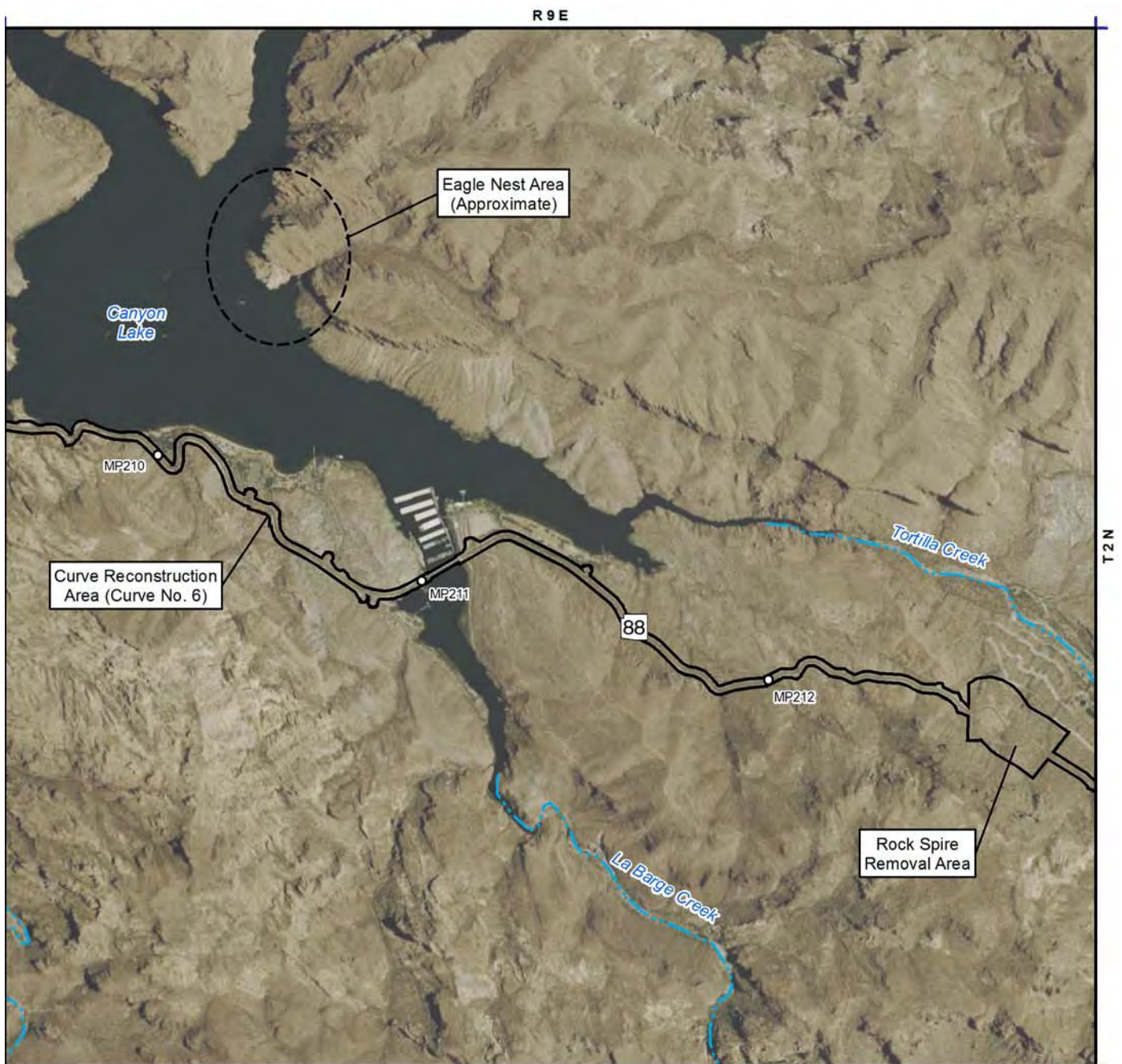
In Arizona, bald eagle nest surveys began in 1972 and have been conducted annually since that time, with the exception of 1976 and 1977. These surveys have been conducted by various state, tribal, and federal agencies. In 2013, the AGFD coordinated the survey of 68 historical, current, and suspected breeding areas throughout the state, finding 54 of those breeding areas to be occupied (McCarty et al. 2013). The AGFD recorded 35 successful breeding attempts in 2013, which produced 58 fledglings. The project occurs in the immediate vicinity of the Tortilla Creek Breeding Area (BA); there is a known nest location at Canyon Lake, approximately 0.5 mile to the north of SR 88. Two eagles were fledged from the Tortilla Creek BA in 2013.

The AGFD has conducted statewide winter counts from 1979 to 1986 and 1991 to 1995 by participating in national bald eagle winter counts organized by the National Wildlife Federation (NWF). In 1995, AGFD and NWF established 115 standardized routes for Arizona's bald eagle winter count. In 2005, after 10 years of surveying the 115 established routes, AGFD analyzed the data to eliminate those routes that were not productive, resulting in a net of 104 standardized routes. More recent modifications to the survey routes resulted in 102 standardized survey routes, of which 98 were able to be surveyed January 7–13, 2013, using a variety of methods to cover diverse habitats statewide. The 2013 winter counts yielded 169 adults, 76 subadults, and 10 unknown eagles. Of these eagles, 9 adults and 1 subadult were documented along the Upper Salt River (upstream of Roosevelt Lake), while 33 adults and 14 subadults were documented along the Lower Salt River (downstream of Saguaro Lake)(McCarty et al. 2013).

Habitat Evaluation and Suitability

Most bald eagle breeding areas are associated with riparian vegetation in central Arizona between 1,080 feet and 4,400 feet (McCarty et al. 2013). They are primarily found in proximity to riparian areas with Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), Arizona sycamore (*Platanus wrightii*), and nonnative tamarisk (*Tamarix* spp.) in association with Sonoran Desertscrub, Interior Chaparral, and Great Basin Conifer Woodlands (McCarty et al. 2013). In Arizona, wintering bald eagles can be seen statewide at elevations ranging from 460 to 7,600 feet in a wide variety of habitats (Hunt 1998). Wintering eagles arrive in the fall, usually late October or early November, and leave in early to mid-April.

Canyon Lake provides suitable foraging habitat for bald eagles. There is a known bald eagle nest (associated with the Tortilla Creek BA) located approximately 0.5 mile north of SR 88 (Figure 6). The



Source: Arizona Transportation Information System GIS Coverage (2013)

Key

Project Area

Miles
0 0.5



Figure 6. Bald eagle nest location (Tortilla Creek Breeding Area)

Tortilla Creek BA was established in 2010 and eagles have successfully fledged young in three of the past four years. Given the relatively high level of boating and recreational water use at Canyon Lake during the breeding season, the success of the eagles at the Tortilla Creek BA demonstrates that the pair is tolerant of the human activity in this area.

Analysis and Determination of Effects

Direct Effects: A bald eagle breeding area (the Tortilla Creek BA) is located in the immediate project vicinity; a bald eagle nest that has been active since 2010 is located approximately 0.5 mile to the north of SR 88. The USFWS, in their *National Bald Eagle Management Guidelines* (2007), recommends a minimum buffer distance of 660 feet to an active nest site for the proposed activity (roadway construction) during the breeding season; a buffer of 0.5 mile is recommended for the loudest activities (e.g., blasting, fireworks). The AGFD's *Conservation Assessment and Strategy for the Bald Eagle in Arizona* (Driscoll et al. 2006) also provides guidelines to protect bald eagle breeding areas from adverse effects; the AGFD recommends a buffer distance up to 2,500 feet from an active nest, depending on the timing of the activity.

The project would not result in the direct loss of suitable nesting habitat for this species and is not expected to impact bald eagle breeding activities at the Tortilla Creek BA because the distance of the project area to the nearest nest site (over 2,500 feet) is sufficient to prevent disturbance to nesting bald eagles, and no downstream impacts that would affect the availability of bald eagle prey species are anticipated. If blasting is used by the contractor to remove the large rock spire at MP 212.70, it would consist of a small charge that is used solely to dislodge the boulder, and would occur approximately 2.25 miles from the bald eagle nest. Blasting and the subsequent removal of any boulder fragments that fall on the roadway are expected to occur at a sufficient distance from the bald eagle nest to also have no impact on eagle nesting or foraging activities. Therefore, no direct impacts are anticipated.

Indirect Effects: Indirect effects are those effects that are caused by or would result from the proposed action and are later in time, but are still reasonably certain to occur. The planned improvements along SR 88 in the project area would not significantly alter existing habitat conditions for the bald eagle, or cause an increase in development, recreational use, or other use that would degrade its habitat in the project vicinity; therefore, no indirect impacts are anticipated.

Determination: Project activities would occur more than 2,500 feet from the bald eagle nest at the Tortilla Creek BA; no direct or indirect impacts are anticipated based on the limited scope of the project and the existing levels of ongoing boating and recreational water use at Canyon Lake. Therefore, the proposed project has no impact on the bald eagle and would not result in take under the Bald and Golden Eagle Protection Act.

7. Species Evaluation – Sensitive Species

Species that are designated as sensitive by the Forest Service include those plant and animal species for which population viability is a current or future concern, and the objectives in managing these species are to ensure their viability throughout their geographic ranges and to preclude trends toward endangerment that would result in the need for future federal listing under the ESA.

Lowland Leopard Frog

TNF Status:	Sensitive
Determination:	May impact individuals, but is not likely to result in a trend toward federal listing or loss of viability

Life History Information

The lowland leopard frog (*Lithobates yavapaiensis*) is a medium-sized frog (up to 3.4 inches) that is tan or olive-brown with dark spots and dorsolateral folds that are broken and inset toward the rear. It usually lacks spots on its snout, and the rear surface of its thigh has a dark brown and tight reticulate pattern (AGFD 2006; Brennan and Holycross 2006).

Historically, the lowland leopard frog ranged from northwestern Arizona through central and southeastern Arizona, southwestern New Mexico, and northern Mexico; populations were also known from southwestern Arizona and southeastern California along the lower Colorado River and in the Coachella Valley (AGFD 2006). This species is currently found in central and southeastern Arizona below the Mogollon Rim, southwestern New Mexico (along the Gila River and San Francisco River), and probably northern Sonora and northwestern Chihuahua, Mexico (AGFD 2006). It is usually found along streams or rivers with dense riparian vegetation, but can also be found in ponds, cienegas, springs, cattle tanks, wetlands, and ditches in association with vegetation communities ranging from Sonoran desertscrub to Madrean evergreen woodland (Brennan and Holycross 2006). In semi-permanent aquatic systems, lowland leopard frogs can survive dry periods by retreating into deep mud cracks, mammal burrows, or rock fissures (AGFD 2006).

In Arizona, lowland leopard frogs breed primarily from January to May, with additional breeding occurring in some populations in summer and early fall after the onset of the summer rains. Females attach their egg masses to submerged vegetation, bedrock, or gravel, and the eggs hatch in 15–18 days. Larvae metamorphose in as little as 3–4 months, or as long as 9 months, and can also overwinter. Larvae are herbivorous and eat algae, organic debris, and small aquatic organisms; adult frogs eat insects and other invertebrates, as well as some small vertebrate prey (AGFD 2006).

The lowland leopard frog does not receive federal protection under the ESA, but is managed as a sensitive species by the TNF.

Survey History

No known formal surveys for this species have been conducted in the project area; however, lowland leopard frogs have been documented as occurring within 3 miles of the project area by the AGFD (see the AGFD's scoping response in Appendix E). The AGFD's HDMS has records within 1 mile of MP 200–202, MP 212–216, and MP 220–229.

Habitat Evaluation and Suitability

The lowland leopard frog is an aquatic habitat generalist that occurs in a variety of natural and man-made aquatic habitats. It occurs in desertscrub, grassland, and pine-oak woodland communities at elevations from 480 to 6,200 feet. Suitable habitats for lowland leopard frogs in the project vicinity include Canyon Lake, as well as the various intermittent and ephemeral drainages that can provide seasonal habitats for breeding or dispersing lowland leopard frogs. Lowland leopard frogs are able to take advantage of seasonally available wetland and stream habitats, and are likely to be found within the project limits in Mesquite and Tortilla creeks at times when surface flows are present.

Analysis and Determination of Effects

Direct Effects: The proposed work would occur at two locations where lowland leopard frogs could be present: the concrete ford crossing of Tortilla Creek (MP 213.3) and the low-water crossing of Mesquite Creek (MP 214.37). Work at the ford crossing would be planned to occur during a dry period for ease of construction and to minimize potential impacts to water quality. However, dewatering could still be required due to subsurface flows and the persistence of water in the bedrock-constrained area immediately downstream of the ford crossing. There is the potential for lowland leopard frogs (adults, young, and/or eggs) to be present within the project limits (or immediately up- or downstream of the project limits) at the time when construction is planned to occur. If lowland leopard frogs are present in or moving through areas that are impacted during construction, individuals may be displaced, injured, or killed.

The measures that would be implemented for the protection of Gila topminnows in Mesquite and Tortilla creeks are expected to also minimize potential impacts to lowland leopard frogs. ADOT proposes to survey for and relocate native frogs at the same time as Gila topminnow removal activities. The relocation of lowland leopard frogs would be coordinated with the AGFD and USFWS to ensure that appropriate areas are selected as receiver sites for any lowland leopard frogs that are removed from the project area. As with the Gila topminnow, the implementation of project-specific mitigation measures is expected to reduce, but

not entirely eliminate potential adverse impacts to lowland leopard frogs.

Indirect Effects: Indirect effects are those effects that are caused by or would result from the proposed action and are later in time, but are still reasonably certain to occur. The proposed project consists of preservation of the existing roadway with additional safety improvements. These activities would not change the baseline conditions for lowland leopard frogs in the project area. The project would not result in potential indirect impacts commonly considered for roadway construction projects, such as habitat loss caused by facilitation of private development, increased mortality from increased traffic volumes, habitat degradation as a result of increased use, or other indirect impacts. Therefore, no indirect effects are anticipated.

Determination: While the project would not result in any loss of aquatic habitats for lowland leopard frogs, there are potential direct effects associated with planned construction activities at Mesquite and Tortilla creeks. Therefore, the project may impact individual lowland leopard frogs, but is not likely to result in a trend toward federal listing or loss of viability.

Mapleleaf False Snapdragon

TNF Status:	Sensitive
Determination:	May impact individuals, but is not likely to result in a trend toward federal listing or loss of viability

Life History Information

The mapleleaf false snapdragon (*Mabrya* [=Maurandya] *acerifolia*) is an herbaceous perennial vine/forb that grows on cliffs and rock ledges. It has a prostrate growth form with stems that are up to 10 inches in length and 1-inch-wide leaves that are heart-shaped to kidney-shaped, coarsely toothed, dark green, downy, and sticky. This species flowers from March through May; it has five-lobed, tubular flowers that are white to greenish-white and up to 1 inch long (AGFD 2005).

The mapleleaf false snapdragon is endemic to south-central Arizona and is known from Fish Creek Canyon and other shaded side canyons associated with the Salt River in the Superstition Mountains (Pinal County), Pinal Mountains (Maricopa County), above Canyon Lake (Maricopa County), and near Horse Mesa Dam (Maricopa County)(AGFD 2000). It grows on rock overhangs, shaded cliffs, and rock ledges in Sonoran desertscrub, and has been documented at elevations from 1,800 to 3,350 feet (AGFD 2000).

The mapleleaf false snapdragon does not receive federal protection under the ESA, but is managed as a sensitive species by the TNF.

Survey History

No known formal surveys for this species have been conducted in the project area; however, mapleleaf false snapdragon has been documented as occurring within 3 miles of the project area by the AGFD (see the AGFD's scoping response in Appendix E). The AGFD's HDMS has records within 1 mile of MP 206–226. An online search of Arizona herbaria found that this species has been collected from several locations in the immediate project vicinity, including the Superstition Wilderness to the south of Canyon Lake, and approximately 0.5 mile to the east of the project area at Fish Creek hill (SEINet 2014). No individuals were observed within the project limits during a site visit conducted on August 26, 2014, though a species-specific survey was not conducted at that time.

Habitat Evaluation and Suitability

The mapleleaf false snapdragon grows on shaded cliffs and rock ledges at elevations from 1,800 to 3,350 feet. Given its known occurrence in the project vicinity, the mapleleaf false snapdragon is assumed to be potentially present in the project area in areas with cliff faces and rock ledges, and could be present within the project limits in the six curve reconstruction areas and the rock spire removal area.

Analysis and Determination of Effects

Direct Effects: The mapleleaf false snapdragon could potentially occur within the project limits and construction activities could result in plants being uprooted, buried, run over (the latter being somewhat unlikely due to this species' occurrence on cliff faces) or otherwise disturbed. A minor loss of potentially suitable habitat along the SR 88 roadway may also occur. Any direct impacts to individuals of this species and its habitat within the project limits are anticipated to be negligible at the population level because of the small area that would be affected and the availability of suitable habitats on the National Forest lands surrounding the project area.

Indirect Effects: Indirect effects are those effects that are caused by or would result from the proposed action and are later in time, but are still reasonably certain to occur. The planned improvements along SR 88 in the project area would not significantly alter existing habitat conditions for the mapleleaf false snapdragon, or cause an increase in development, recreational use, or any other use that would degrade its habitat in the project vicinity; therefore, no indirect impacts are anticipated.

Determination: There are potential direct effects to mapleleaf false snapdragons associated with planned construction activities along SR 88, as well as a minor loss of potentially suitable habitat; however, the amount of habitat that would be affected or lost is minimal. Therefore, the project may impact individuals of mapleleaf false snapdragon, but is not likely to result in a trend toward federal listing or loss of viability.

Pima Indian Mallow

TNF Status:	Sensitive
Determination:	May impact individuals, but is not likely to result in a trend toward federal listing or loss of viability

Life History Information

Pima Indian mallow (*Abutilon parishii*) is an herbaceous shrubby perennial that typically has 1–11 stems that arise from a woody base and grow up to 3 feet tall. Its velvety, heart-shaped leaves are dark green above and nearly white underneath. Pima Indian mallow flowers in the spring, summer, and fall in response to precipitation; it has small, orange, five-petaled flowers that open only for short periods on sunny afternoons. The plant's stems and empty fruit capsules persist throughout the winter, aiding in its identification during periods when flowers are not present (AGFD 2000; TNF 2000).

Pima Indian mallow is known from the Superstition Mountains (Maricopa County); Santa Catalina, Rincon, Silverbell, and Tucson mountains (Pima County); Mineral Hills, Superstition, Picacho, Tortolito, and Dripping Springs mountains (Pinal County); Santa Rita and Tumacacori mountains (Santa Cruz County); Little Shipp Wash and Cottonwood Creek (Yavapai County)(AGFD 2000). It occurs in full sun within higher elevation Sonoran desertscrub, desert grassland, and Sonoran deciduous riparian forest communities from 1,720 to 4,900 feet, typically in canyons with southern or western exposures (AGFD 2000; TNF 2000).

Pima Indian mallow does not receive federal protection under the ESA, but is managed as a sensitive species by the TNF.

Survey History

No known formal surveys for this species have been conducted in the project area; however, Pima Indian mallow has been documented as occurring within 3 miles of the project area by the AGFD (see the AGFD's scoping response in Appendix E). The AGFD's HDMS has records within 1 mile of MP 202–203, MP 206–211, and MP 216–226. No individuals were observed within the project limits during a site visit conducted on August 26, 2014, though a species-specific survey was not conducted at that time.

Habitat Evaluation and Suitability

Pima Indian mallow typically grows among rocks and boulders in mesic situations, rocky hillsides, cliff bases, lower side slopes, and ledges of canyons at elevations from 1,720 to 4,900 feet (AGFD 2000; TNF 2000). There is suitable habitat for this species throughout the project area, including the six curve reconstruction locations as well as roadside locations that would be disturbed during construction of the proposed improvements.

Analysis and Determination of Effects

Direct Effects: Pima Indian mallow could potentially occur within the project limits and construction activities could result in plants being uprooted, buried, run over, or otherwise disturbed. A minor loss of potentially suitable habitat along the SR 88 roadway may also occur. Any direct impacts to individuals of this species and its habitat within the project limits are anticipated to be negligible at the population level because of the small area that would be affected and the availability of suitable habitats on the National Forest lands surrounding the project area.

Indirect Effects: Indirect effects are those effects that are caused by or would result from the proposed action and are later in time, but are still reasonably certain to occur. The planned improvements along SR 88 in the project area would not significantly alter existing habitat conditions for the Pima Indian mallow, or cause an increase in development, recreational use, or any other use that would degrade its habitat in the project vicinity; therefore, no indirect impacts are anticipated.

Determination: There are potential direct effects to Pima Indian mallow associated with planned construction activities along SR 88, as well as a minor loss of potentially suitable habitat; however, the amount of habitat that would be affected or lost is minimal. Therefore, the project may impact individuals of Pima Indian mallow, but is not likely to result in a trend toward federal listing or loss of viability.

8. Mitigation Measures

General/Coordination Commitments

The following mitigation measures would be implemented to address the AGFD's stated concerns for the project (additional information is included in Appendix A):

- ADOT will coordinate with the AGFD to confirm that bald eagle nesting locations are over 660 feet from project activities and over 2,600 feet from any project-related blasting.
- ADOT will coordinate with the AGFD to coordinate the timing of project construction with regard to bighorn sheep transplant activities in the area.
- Construction activities will be restricted to designated work areas to minimize the area of disturbance.

Water Quality

- Construction impacts will be confined to the minimum area necessary to complete the project.
- Measures will be implemented to prevent lubricants, hydraulic fluid, coolants, fuel and other

construction-related materials and contaminants from entering any water body.

- Best management practices will be implemented to control erosion and prevent pollution related to construction activities.
- A plan for managing temporary water diversion will be implemented during construction to protect sensitive aquatic resources and meet pollution and erosion control requirements.

Gila Topminnow

- Work at the Tortilla Creek ford crossing and Mesquite Creek low-water crossing will be conducted during the months of April, May, and June, when surface flows are expected to be lowest.
- ADOT will coordinate with the USFWS and AGFD to develop a fish and native frog exclusion protocol and relocation plan for Gila topminnow prior to completion of the Biological Opinion.
- Listed fish species and native frogs will be removed from the work area at the Tortilla Creek ford crossing prior to any in-water work activities. Fish exclusion activities will be performed under the direction of a biologist holding a permit for recovery of Gila topminnow and will be relocated per the plan developed in coordination with the USFWS and AGFD.
- No work will be allowed in flowing surface water unless fish exclusion measures are being implemented.
- All concrete will be poured in the dry, or within confined waters not being discharged to surface waters, will be allowed to cure to 90 percent of final compressive strength as determined by laboratory testing of field-poured concrete cylinders and then will be sealed with a methacrylate sealer before contact with surface water is allowed.
- Water that is pumped from Tortilla Creek to dewater the ford reconstruction work area will not be discharged at turbidity levels greater than 10 percent above the background level, as measured within 100 feet of the ford crossing.
- Discharge of water back to the stream will occur in such a manner as not to cause erosion.
- The contractor will stop work immediately and inform the Engineer if surface flows enter the in-water work area at any time following the initial isolation or diversion activities. The Engineer will arrange for fish and native frog exclusion and relocation per the USFWS-approved plan before allowing work to commence again.
- Erosion and pollution control measures will be installed and maintained per Clean Water Act permits under the guidance of the Arizona Department of Transportation Erosion and Pollution Control Manual

to ensure that no foreign materials, such as pavement slurry from asphalt grinding equipment or chip seal materials, are sidecast, and to control and prevent sediments from entering aquatic systems.

Sonoran Desert Tortoise

- ADOT will arrange for preconstruction environmental awareness training for all ADOT and contractor personnel working at the site. The training will include information on wetlands, lowland leopard frog, Gila topminnow, Sonoran desert tortoise, bighorn sheep, and herpetofauna at a minimum.
- A biologist with experience handling Sonoran desert tortoises will monitor initial vegetation removal at each of the curve reconstruction locations and at the Tortilla Creek ford crossing.
- A biologist with experience handling Sonoran desert tortoises, locating tortoise burrows, and familiar with bighorn sheep hazing procedures will monitor the activities associated with removal of the rock spire at MP 212.70 to avoid or minimize impacts of the activity on wildlife in the area.
- If any desert tortoises are encountered in the project area, the contractor shall take any measures necessary to ensure that project activities will not harm or disturb any desert tortoise. The contractor shall notify the Engineer if a desert tortoise is encountered during construction.
- The contractor shall require all on-site workers to check under their parked vehicles and equipment prior to driving to make sure there isn't a tortoise sheltering underneath the vehicle or piece of equipment. If a desert tortoise is found sheltering underneath a parked vehicle or piece of equipment, the tortoise shall be allowed to move out from under the vehicle on its own or be relocated following the current guidelines for Sonoran desert tortoise handling before the vehicle can be moved.
- If any Sonoran desert tortoises are encountered during construction, the contractor shall adhere to the current handling guidelines for Sonoran desert tortoises.

Migratory Birds

- If vegetation clearing will occur during the migratory bird breeding season (March 1–August 31), the contractor shall avoid any active bird nests. If the active nests cannot be avoided, the contractor shall notify the Engineer to evaluate the situation. During the non-breeding season (September 1–February 28) vegetation removal is not subject to this restriction.
- If any active bird nests cannot be avoided by vegetation clearing activities, the Engineer will contact the Environmental Planning Group Biologist (602.622.9622 or 602.712.7767) to evaluate the situation.

Invasive Species

- All disturbed soils not paved that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.
- Prior to the start of ground-disturbing activities, the contractor shall arrange for and perform the control of noxious and invasive species in the project area.
- Equipment will be cleaned prior to arriving on site and prior to leaving work sites where invasive or noxious species are present.

9. Coordination

The AGFD, TNF, and USFWS were consulted for species concerns during the development of this Biological Evaluation, and the agency responses are provided in Appendix E. Scoping letters were sent to the AGFD, TNF, and USFWS on October 2, 2014. Formal response letters have not been received from the TNF or USFWS as of the submittal of this document; however, both of these agencies were consulted during the development of this Biological Evaluation. Cheri Bouch r with the AGFD provided a letter response on November 4, 2014; a summary of the AGFD's response and a discussion of how the AGFD's concerns are being addressed are provided in Appendix A. This project was reviewed by the ADOT Natural Resources Section to identify areas infested with invasive species; Michael Srogoncik with Central Region Natural Resources provided an email response on January 20, 2015. The individuals that were corresponded with during the preparation of this Biological Evaluation included:

ADOT Natural Resources Section

Michael Srogoncik, Highway Operations Superintendent, Central Region Natural Resources

Arizona Game and Fish Department

Cheri Bouch r, Project Evaluation Program Specialist, Habitat Branch

Dana Warnecke, Habitat Specialist, Region VI

Tonto National Forest

Kelly Kessler, Range/Wildlife Staff - Zone Range Staff, Mesa Ranger District

US Fish and Wildlife Service

Jessica Gwinn, Fish and Wildlife Biologist, Arizona Ecological Services Field Office

Mike Martinez, Fish and Wildlife Biologist, Arizona Ecological Services Field Office

Steve Spangle, Field Supervisor, Arizona Ecological Services Field Office

10. Literature Cited

- Arizona Game and Fish Department. 2000. *Abutilon parishii*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- . 2001. *Poeciliopsis occidentalis occidentalis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- . 2005. *Mabrya acerifolia*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- . 2006. *Rana yavapaiensis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- . 2010. *Gopherus agassizii*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- . 2011. *Haliaeetus leucocephalus*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- . 2012. *The Maricopa County Wildlife Connectivity Assessment: Report on Stakeholder Input*. Arizona Game and Fish Department, Phoenix.
- Arizona Interagency Desert Tortoise Team. 1996. Murray, R. C. and V. Dickinson, eds. *Management Plan for the Sonoran Desert Population of the Desert Tortoise in Arizona*. Arizona Interagency Desert Tortoise Team.
- Arizona Wildlife Linkages Workgroup. 2006. *Arizona's Wildlife Linkages Assessment*. The Arizona Wildlife Linkages Workgroup, Phoenix.
- Brennan, T. C. and A. T. Holycross. 2006. *A Field Guide to Amphibians and Reptiles in Arizona*. Arizona Game and Fish Department, Phoenix.
- Driscoll, J. T., K. V. Jacobson, G. L. Beatty, J. S. Canaca, and J. G. Koloszar. 2006. *Conservation assessment and strategy for the bald eagle in Arizona*. Nongame and Endangered Wildlife Program Technical Report 173. Arizona Game and Fish Department, Phoenix.
- Grandmaison, D. D., M. F. Ingraldi, F. R. Peck. 2010. Desert Tortoise Microhabitat Selection on the Florence Military Reservation, South-Central Arizona. *Journal of Herpetology*, Vol. 44, No. 4, pp. 581–590.
- Hunt, W. G. 1998. "Bald Eagle". In *The Raptors of Arizona*, edited by R. Glinski. 50-54. Arizona Game and Fish Department, Phoenix.

- Law, D. W. and S. Setunge. 2014. "The impact of curing compounds on the leaching from concrete." In *Concrete Solutions*, edited by M. Grantham, P. A. M. Basheer, and B. Magee, pp. 403–407. Taylor and Francis Group, London.
- Logan Simpson Design Inc. 2013. *SR 88, Goldfield to Canyon Lake Safety Enhancements (TRACS No. 088 MA 203 H7005 01C; Federal Project No. 088-A(200)T) Geotechnical Investigation Biological Mitigation Report January 29–March 26, 2013*. Tempe, Arizona.
- Marshall, R. M., S. Anderson, M. Batcher, P. Comer, S. Cornelius, R. Cox, A. Gondor, D. Gori, J. Humke, R. Paredes Aguilar, I.E. Parra, S. Schwartz. 2000. *An Ecological Analysis of Conservation Priorities in the Sonoran Desert Ecoregion*. Prepared by The Nature Conservancy Arizona Chapter, Sonoran Institute, and Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora with support from Department of Defense Legacy Program, Agency and Institutional partners.
- McCarty, K. M., K. L. Licence, and K. V. Jacobson. 2013. *Arizona Bald Eagle Management Program 2013 Summary Report*. Nongame and Endangered Wildlife Program Technical Report 276. Arizona Game and Fish Department, Phoenix.
- Minckley, W. L. 1973. *Fishes of Arizona*. Arizona Game and Fish Department, Phoenix.
- SEINet. 2014. Southwestern Environmental Information Network. Available: <http://swbiodiversity.org/seinet/index.php> (Accessed November 12, 2014).
- Tonto National Forest. 2000. *Tonto National Forest Threatened, Endangered and Sensitive (TES) Species 2000 Draft Abstracts*. 80 pp.
- Turner, R. M., and D. E. Brown. 1994. "Sonoran Desertscrub." In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by D. E. Brown, pp. 180–221. University of Utah Press. Salt Lake City.
- US Army Corps of Engineers. 2015. Preliminary Jurisdictional Determination regarding geographic jurisdiction for Tortilla Creek, File No. SPL-2011-00437-KAT. US Army Corps of Engineers Arizona Branch Regulatory Division. June 30, 2015.
- US Fish and Wildlife Service. 1967. Native fish and wildlife; endangered species. *Federal Register* 32(48):4001.
- . 1984. Sonoran Topminnow Recovery Plan. US Fish and Wildlife Service, Albuquerque.
- . 2007. *National Bald Eagle Management Guidelines*. US Fish and Wildlife Service.
- . 2008. Gila Topminnow – General Species Information. Arizona Ecological Services Field Office website, <http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Gila%20Topminnow%20RB>.

pdf. Accessed November 13, 2014.

———. 2010. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Sonoran Population of the Desert Tortoise as Endangered or Threatened; Proposed Rule. *Federal Register* 75(239):78094–78146.

———. 2014. Sonoran Desert Tortoise – General Species Information. Arizona Ecological Services Field Office website, <http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Sonoran%20Tortoise%20RB.pdf>. Accessed May 12, 2015.

Voeltz, J. B. and R. H. Bettaso. 2003. 2003 Status of the Gila Topminnow and Desert Pupfish in Arizona. Nongame and Endangered Wildlife Program Technical Report 226. Arizona Game and Fish Department, Phoenix.

Weedman, D. A. 1998. Gila topminnow, *Poeciliopsis occidentalis occidentalis*, Revised Recovery Plan. Arizona Game and Fish Department, Phoenix. Prepared for Region 2 U.S. Fish and Wildlife Service, Albuquerque.

Weedman, D. A. and K. L. Young. 1997. Status of the Gila Topminnow and Desert Pupfish in Arizona. Nongame and Endangered Wildlife Program Technical Report 118. Arizona Game and Fish Department, Phoenix.

11. Additional Information

Logan Simpson biologist Ian Tackett conducted a field review of the project area on August 26, 2014. Photographs and field notes are on file at Logan Simpson and at the ADOT Environmental Planning Group office.

12. Signatures

Prepared By:  Date: July 29, 2015
Ian Tackett, Senior Biologist
Logan Simpson

Reviewed/Approved By:  Date: July 29, 2015
Richard Remington, Senior Biologist
Logan Simpson

Appendix A

State Sensitive Species and Migratory Bird Treaty Act Analysis

I. State Sensitive Species

The Arizona Game and Fish Department (AGFD) On-line Environmental Review Tool was accessed to determine special status species known to occur in the project vicinity (Report No. HGIS-01275, dated May 5, 2015). As part of the environmental review process, a letter describing the project was sent to the AGFD on October 2, 2014, to inform them of the project and to solicit comments. The letter requested any specific concerns, suggestions or recommendations the agency may have related to the project.

The AGFD On-line Environmental Review Tool Report included a list of special status species known to occur in the project vicinity, and the AGFD returned a response letter dated November 4, 2014 (refer to Appendix E). The AGFD's response letter provided recommendations for avoiding impacts to bald eagles, coordinating project-specific measures for the protection of bighorn sheep, addressing potential impacts to Sonoran desert tortoises, evaluating the presence of bridge-roosting bats, conducting a native plant inventory, controlling erosion and preventing runoff, and minimizing the potential for introduction or spread of exotic invasive species. These concerns were discussed with Dana Warnecke, AGFD's Region VI Habitat Specialist, during a conference call on December 5, 2014. The following mitigation measures would be implemented to address the AGFD's concerns for the project:

- ADOT will coordinate with the AGFD to coordinate the timing of project construction with regard to bighorn sheep transplant activities in the area.
- A biologist with experience handling Sonoran desert tortoises, locating tortoise burrows, and familiar with bighorn sheep hazing procedures will monitor the activities associated with removal of the rock spire at MP 212.70 to avoid or minimize impacts of the activity on wildlife in the area.
- ADOT will arrange for preconstruction environmental awareness training for all ADOT and contractor personnel working at the site. The training will include information on wetlands, lowland leopard frog, Gila topminnow, Sonoran desert tortoise, bighorn sheep, and herpetofauna at a minimum.

The AGFD on-line environmental review tool included a standard response for treatment and management of invasive species. This project was reviewed by the ADOT Natural Resources section in order to identify areas infested with invasive species. Invasive species that have been observed in the project area include buffelgrass (*Pennisetum ciliare*), fountaingrass (*Pennisetum setaceum*), Russian thistle (*Salsola tragus*), Sahara mustard (*Brassica tournefortii*), and field bindweed (*Convolvulus arvensis*). This project would incorporate the following measures in order to prevent the introduction and spread of invasive species:

- All disturbed soils not paved that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.

- Prior to the start of ground-disturbing activities, the contractor shall arrange for and perform the control of noxious and invasive species in the project area.
- Equipment will be cleaned prior to arriving on site and prior to leaving work sites where invasive or noxious species are present.

The AGFD on-line environmental review tool included a standard response regarding local or regional needs of wildlife movement, connectivity, access to habitat needs and design of various roadway features such as culverts and bridges. ADOT, AGFD, FHWA, and representatives from other agencies have completed a Wildlife Linkages Assessment to address important wildlife movement corridors in Arizona (Arizona Wildlife Linkage Workgroup 2006). No priority linkages were identified in the project area in the 2006 *Arizona's Wildlife Linkages Assessment*. Two linkages that were identified in *The Maricopa County Wildlife Connectivity Assessment: Report on Stakeholder Input* (AGFD 2012) are present in the project area: Goldfield Mountains–Superstition Wilderness (SR 88 MP 199.5 to 205) and Superstition Wilderness–Mazatzal Mountains (Four Peaks Wilderness)(SR 88 MP 208–232). The planned roadway preservation and safety improvements would not result in decreased connectivity for wildlife in the project area.

II. Migratory Bird Treaty Act

Migratory birds are protected by the federal Migratory Bird Treaty Act of 1916, as amended, which prohibits injury or death to migratory birds and their active nests, eggs, and young. The following mitigation measures would be implemented to address potential impacts to nesting birds during construction:

- If vegetation clearing will occur during the migratory bird breeding season (March 1–August 31), the contractor shall avoid any active bird nests. If the active nests cannot be avoided, the contractor shall notify the Engineer to evaluate the situation. During the non-breeding season (September 1–February 28) vegetation removal is not subject to this restriction.
- If any active bird nests cannot be avoided by vegetation clearing activities, the Engineer will contact the Environmental Planning Group Biologist (602-712-6819) to evaluate the situation.

Appendix B

Project Area Photographs

Photo Log (photos taken August 26, 2014)

Photo(s)	Milepost	Description
1	201.95	Planned staging area
2–3	203.4-203.6	Curve 1
4–6	204.24–204.36	Curve 2
7–8	204.5	Curve 3
9–10	205	Along roadway
11	206.3	Curve 4
12–13	207	Along roadway
14–15	208	Planned staging area
16–17	208.3	Curve 5
18–19	208.4	Overview of Canyon Lake
20–22	209.6	First Water Creek Bridge
23–25	210.4	Curve 6
26–28	211	Boulder Canyon Bridge
29–30	212	Along roadway
31–35	212.6	Rock Spire
36–38	213.3	Tortilla Creek Ford
39–40	214	Along roadway
41–42	214.37	Mesquite Creek Low-water Crossing
43–44	214.37	Planned Staging Area
45–46	215.8	Along roadway
47–48	216.4	Along roadway
49–50	218.3	Along roadway
51–52	219.7	Along roadway
53–54	220.2	Eastern Construction Limit



Photo 1. View to the southwest of a planned staging area at MP 201.95.



Photo 2. View to the south of Curve 1 at MP 203.5.



Photo 3. View to the northeast of Curve 1 at MP 203.5 (opposite view of the previous photo).



Photo 4. View to the northeast of Curve 2 at MP 204.24.



Photo 5. View to the southeast from the middle of Curve 2 at MP 204.3.



Photo 6. View to the northeast from the middle of Curve 2 at MP 204.3 (opposite view from the previous photo).



Photo 7. View to the southeast from the middle of Curve 3 at MP 204.5.



Photo 8. View to the northeast from the middle of Curve 3 at MP 204.5 (opposite view from the previous photo).



Photo 9. View to the southwest at MP 205.



Photo 10. View to the northeast at MP 205 (opposite view from the previous photo).



Photo 11. View to the north of Curve 4 at MP 206.3.



Photo 12. View to the south at MP 207.



Photo 13. View to the south at MP 207 (opposite view from the previous photo).



Photo 14. View to the northeast of a planned staging area at MP 208 (the cleared area in the background).



Photo 15. View to the east of a planned staging area at MP 208 (panned right from the previous photo).



Photo 16. View to the southwest from the middle of Curve 5 at MP 208.3.



Photo 17. View to the east from the middle of Curve 5 at MP 208.3 (opposite view from the previous photo).



Photo 18. Overview of Canyon Lake - view to the northeast from the Canyon Lake Vista overlook.



Photo 19. Overview of Canyon Lake - view to the east from the Canyon Lake Vista overlook (panned right from the previous photo).



Photo 20. View to the east of the First Water Creek Bridge (Structure No. 26) at MP 209.6.



Photo 21. Close-up view of the First Water Creek Bridge.



Photo 22. View to the south of the First Water Creek inlet from the deck of the First Water Bridge.



Photo 23. View to the east of Curve 6 at MP 210.4.



Photo 24. View to the west from the middle of Curve 6 at MP 210.45.



Photo 25. View to the southeast from the middle of Curve 6 at MP 210.45 (opposite view from the previous photo).



Photo 26. View to the northeast of the eastbound approach to the Boulder Canyon Bridge at MP 211.



Photo 27. View to the southeast of the inlet at Boulder Creek from the east side of the Boulder Canyon Bridge.



Photo 28. View of the Boulder Canyon Bridge from the eastern bridge abutment.



Photo 29. View to the west from just east of MP 212.



Photo 30. View to the northeast from just east of MP 212 (opposite view of the previous photo).



Photo 31. View to the southeast of the rock spire from near MP 212.6.

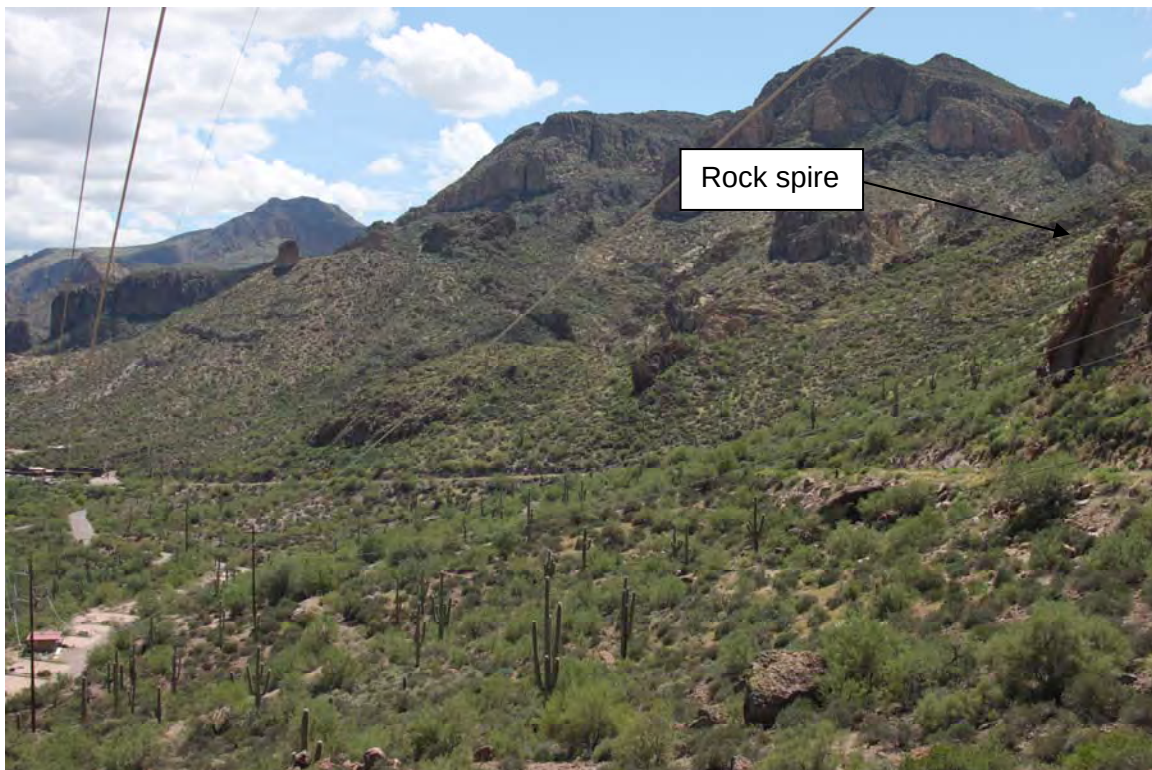


Photo 32. View to the southeast of the potential impact area below the rock spire (panned left from the previous photo).



Photo 33. View to the west of the rock spire from MP 212.85.



Photo 34. View to the east along the access route up to the rock spire.



Photo 35. View of the base of the rock spire.



Photo 36. View to the northeast of the ford crossing of Tortilla Creek.



Photo 37. View to the west along the downstream (north) side of the ford crossing of Tortilla Creek.



Photo 38. View to the east of the upstream (south) side of the ford crossing of Tortilla Creek.



Photo 39. View to the west from just east of MP 214.



Photo 40. View to the northeast from just east of MP 214 (opposite view of the previous photo).



Photo 41. View to the northwest (upstream) at the SR 88 low-water crossing of Mesquite Creek.



Photo 42. View to the southeast (downstream) at the SR 88 low-water crossing of Mesquite Creek.



Photo 43. View to the north of a planned staging area at MP 214.37.



Photo 44. View to the south of a planned staging area at MP 214.37 (opposite view of the previous photo).



Photo 45. View to the west at MP 215.8.



Photo 46. View to the east at MP 215.8 (opposite view of the previous photo).



Photo 47. View to the southwest at MP 216.4.



Photo 48. View to the northeast at MP 216.4 (opposite view of the previous photo).



Photo 49. View to the west at MP 218.3.



Photo 50. View to the east at MP 218.3 (opposite view of the previous photo).



Photo 51. View to the northwest at MP 219.7.



Photo 52. View to the northeast at MP 219.7 (panned right from the previous photo).



Photo 53. View to the northwest at MP 220.2.



Photo 54. View to the southeast of the eastern project limits at MP 220.2 (opposite view of the previous photo).

Appendix C

Agency Correspondence

Agency Correspondence	Date
Email from Kris Gade to TNF (summary of phone discussion with USFWS)	12/16/2014
Email from TNF to Kris Gade/Ian Tackett (identification of species of concern for the project)	11/6/2014
Scoping response letter from AGFD	11/4/2014
Invasive plant info from ADOT Natural Resources	1/20/2015
AGFD On-line Review Tool Report	5/5/2015
Official USFWS species list	7/29/2015

Kristin Gade

From: Kristin Gade
Sent: Tuesday, December 16, 2014 2:46 PM
To: 'Kessler, Kelly M -FS'; ITackett@LOGANSIMPSON.COM
Cc: Mike Martinez; Jessica Gwinn (jessica_gwinn@fws.gov)
Subject: RE: H8112, Apache Trail ADOT project

Hi Kelly and Ian –

I just spoke with Jessica Gwinn and Mike Martinez to follow up since we hadn't received a scoping response from USFWS. I explained the project and the potential for Gila topminnow and bald eagle concerns. They agreed that seasonal restriction of excessive or high pitched noise in the vicinity of the bald eagle nest during breeding season sounded like a good approach. We talked about making a determination for the Gila topminnow given that it is a 10(j) population but if we found them in the project area they might be considered outside of the 10(j) area. Mike is going to follow up with Doug Duncan to get information on how that has been handled in the past.

We discussed an approach for informal consultation using mitigation measures that could include:

- 1) Avoiding work during times the creek is likely to be flowing (monsoon/winter rains) or using block nets up and downstream during construction
- 2) Seining the pool prior to starting work (need contractor with Section 10 permit for topminnow, likely we'd use AGFD) and if any topminnow are found, relocating them (probably upstream to the known population area, but Mike is going to check with Doug Duncan for input on that).
- 3) Not dewatering the pool during construction – if we did have to dewater the pool, that could cause an effect to a topminnow as a result of our project and would put us into formal consultation.
- 4) Jessica asked about the length/distance of dry stream that typically occurs between the pool and the topminnow areas. I forwarded the email from Ross Timmons with the map of the population areas, but I don't know what section of the stream dries up. Do either of you have that information?

We also discussed that ADOT would submit a draft version of the BE to FWS prior to initiating informal consultation to get advance comments on the mitigation approach. I let them know that I would talk with Kelly about whether that would be concurrent with or after the Forest review of the document.

Let me know if you have thoughts or concerns on this approach and I will talk with you soon –

Kris

Kris Gade, PhD
Roadside Resources Specialist
ADOT Environmental Planning Group
1611 W. Jackson St., Mail Drop EM02
Phoenix, AZ 85007
602.292.0301
azdot.gov



LSD Floating User

From: Kessler, Kelly M -FS [kmkessler@fs.fed.us]
Sent: Thursday, November 06, 2014 9:58 AM
To: kgade@azdot.gov; Ian Tackett
Cc: Lane, Terrin N -FS; Mona, Joel G -FS
Subject: RE: SR88 Biological Report
Attachments: 2014 TNF Species List.pdf

Hi Kris,

Attached in the most current species list for sensitive, threatened, endangered, and candidate species as well as MIS and migratory birds.

The primary species along SR 88 are Gila topminnow, bald eagle, Sonoran desert tortoise, lowland leopard frog, and some sensitive plants (Alamos deer vetch, Pima Indian mallow, and mapleleaf false snapdragon).

I look forward to working with you. Please let me know if you have any questions.

Thanks!

Kelly M. Kessler
Range Staff South Zone
Mesa and Cave Creek Ranger Districts
Wildlife Biologist Mesa Ranger District
Tonto National Forest
480.610.3305

From: Lane, Terrin N -FS
Sent: Thursday, November 06, 2014 8:13 AM
To: Kessler, Kelly M -FS
Cc: ITackett@LOGANSIMPSON.COM; kgade@azdot.gov; Mona, Joel G -FS
Subject: SR88 Biological Report

Good Morning Kelly,

Kris Gade is working on the Bio Report for the Apache Trail and is looking for the R3 Mesa Sensitive Species List and wanted to know if there were any species that we would like to see a detailed analysis on. Below is the link to the Threatened, Endangered & Sensitive Species list from our website but I am not sure if it is up-to-date. Could you please contact Kris or Ian Tackett from LSD concerning this information?

http://www.fs.usda.gov/detail/tonto/learning/nature-science/?cid=fsbdev3_018776

Thanks,

Terrin Lane
ADOT Liaison
Civil Engineer
Tonto National Forest
(602) 225-5223
tnlane@fs.fed.us



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

GOVERNOR

JANICE K. BREWER

COMMISSIONERS

CHAIRMAN, J.W. HARRIS, TUCSON
ROBERT E. MANSELL, WINSLOW
KURT R. DAVIS, PHOENIX
EDWARD "PAT" MADDEN, FLAGSTAFF
JAMES R. AMMONS, YUMA

DIRECTOR

LARRY D. VOYLES

DEPUTY DIRECTOR

TY E. GRAY



November 4, 2014

Ms. Nancy Shelton
Logan Simpson Design Inc.
51 West Third Street, Suite 450
Tempe, AZ 85281

Re: Review of the SR 88- Apache Junction to Tortilla Flat; 088 MA 203 H8112
01C, STP 088-A(202)T.

Dear Ms. Shelton:

The Arizona Game and Fish Department (Department) received an initial request for detailed data related to bald and golden eagles in the vicinity of your pavement preservation project, via electronic mail on May 6, 2014. The Department responded with a preliminary review letter on May 12, 2014.

This pavement preservation, realignment, and improvement project encompasses an approximately 17 mile stretch of State Route 88, and is located in Maricopa County, AZ. We have reviewed the information provided in your October 2, 2014 correspondence. The Department accessed the Heritage Data Management System (HDMS)'s On-line Review Tool on your behalf to provide updated receipts (attached), as the previous receipts were over six months old. In addition to the nesting golden eagles (*Aquila chrysaetos*) and wintering and nesting bald eagles (*Haliaeetus leucocephalus*) identified on the receipts, a number of other special status species have been recorded within a three mile radius of the project, including the federally listed endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*), the Sonoran Desert tortoise (*Gopherus morafkai*), which is a candidate for federal listing, and a bat colony. An important population of desert bighorn sheep (*Ovis canadensis nelsoni*) is also present within the mountains surrounding the proposed project.

The Department offers the following general comments, based on the information provided:

- The nearest golden eagle nesting location is approximately 4 miles north of Tortilla Flat. The nearest bald eagle nest is approximately 0.5 miles north of the SR 88 as it parallels Canyon Lake. Any blasting activities, or other activities with the potential for noise disturbance, to be conducted during construction, should avoid breeding

season for the bald eagle (December 1 to June 30), starting with the December 1, 2014 to June 30, 2015 breeding season. Additionally, any helicopter use during project construction should avoid the overall eagle breeding season of December 1 to July 31 (includes bald and golden eagles); if eagle breeding season cannot be avoided, all flight plans for the proposed project, including the location of helicopter staging areas, should be approved by the U. S. Fish and Wildlife Service (USFWS) and the Department prior to any project related flight operations.

- An important population of desert bighorn sheep (*Ovis canadensis nelsoni*) is present within the mountains surrounding the proposed project. Lambing season for this Tortilla Flats bighorn sheep population begins as early as October and continues through April, with peak lambing season occurring from the beginning of December through the end of January. In addition, peak movement of bighorn sheep across the SR 88 occurs from June through August. The Department requests further coordination with the Arizona Department of Transportation (ADOT) to identify project-specific measures that will help avoid and/or minimize impacts to desert bighorn sheep, including the evaluation of all right-of-way fencing to be installed or relocated along the project route.
- Sonoran Desert tortoise have been recorded at a number of locations adjacent to the proposed project. Survey guidelines and recommended mitigation measures for this species can be found on the Department's website.
<http://www.azgfd.gov/hgis/guidelines.aspx>
- The Department conducts a number of aerial surveys and other activities via helicopter in the vicinity, especially in the months of September and November. We request notification and further communication with ADOT regarding timing and location of blasting activities to address any safety and/or scheduling conflicts for ADOT and Department activities.
- Please evaluate the presence of bats within or adjacent to the proposed project. If work for the project will take place on any bridges or larger culverts that would affect the underside of the bridge/culvert (i.e. asphalt seeping through the cracks, etc.), please determine if the bridge/culvert is providing day and/or night time roosting habitat for bats. Additionally, please determine if any bats are roosting within, or adjacent to, any areas where blasting will occur. If necessary, bat surveys should be conducted prior to any work on or immediately adjacent to these areas; and surveys should be scheduled far in advance of proposed work to allow for schedule modification to avoid disruption of maternity roosts during the breeding season. Refer to the *Guidelines for Bridge Construction or Maintenance to Accommodate Fish & Wildlife Movement and Passage*, for additional guidance on bats as appropriate.
<http://www.azgfd.gov/hgis/pdfs/BridgeGuidelines.pdf>
- If proposed ground disturbance (both temporary and permanent) will meet or exceed 0.25 acre, a Native Plant Inventory should be conducted to identify, record, and coordinate plant salvage efforts for species that are protected under the Arizona Native Plant Law (<http://www.azda.gov/esd/NativePlants.aspx>). In addition, the

Ms. Nancy Shelton

November 4, 2014

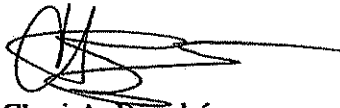
3

applicable land management agencies should be consulted regarding guidelines for revegetation efforts.

- Lowland leopard frog (*Lithobates yavapaiensis*) and Gila longfin dace (*Agosia chrysogaster chrysogaster*), both USFWS species of special concern, and the federally endangered Gila topminnow, have been recorded in Tortilla Creek, immediately adjacent to the SR 88. In order to prevent impacts to habitat for these and other aquatic wildlife species adjacent to the project, please implement erosion control measures during the project to prevent the introduction of sediment-laden runoff into adjacent surface waters, and to prevent impacts to surface water quality. Stabilize exposed soils, particularly on slopes, with native vegetation as soon as possible to prevent excess erosion.
- Please minimize the potential introduction or spread of exotic invasive species. Wash all equipment utilized in the project activities before entering and leaving the site, and comply with Arizona's noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245); please see the Arizona Department of Agriculture website for prohibited and restricted noxious weeds.
<http://www.azda.gov/PSD/RegulatedRestrictedNoxiousWeeds.aspx>
<http://www.azda.gov/PSD/ProhibitedNoxiousWeeds.aspx>

The Department requests further coordination with ADOT regarding this project as the design and scope progresses. Please contact Dustin Darveau at ddarveau@azgfd.gov (480-324-3555), and Dana Warnecke at dwarnecke@azgfd.gov (480-324-3547) to discuss wildlife and wildlife habitat issues as well as notification of blasting activities, as discussed above. We appreciate the opportunity to provide preliminary recommendations to avoid and minimize impacts to wildlife or wildlife habitats associated with the SR 88-Apache Trail, Goldfield to Canyon Lake pavement preservation project activities. If you have any questions regarding this letter, please contact me at (623) 236-7615, and visit our website for additional guidelines at <http://www.azgfd.gov/hgis/guidelines.aspx>.

Sincerely,



Cheri A. Bouchér
Project Evaluation Program Specialist, Habitat Branch
Arizona Game and Fish Department

cc: Laura Canaca, Project Evaluation Program Supervisor
Kelly Wolff-Krauter, Habitat Program Manager, Region VI
Dana Warnecke, Habitat Specialist, Region VI
Dustin Darveau, Game Specialist, Region VI

AGFD# M14-10083912

LSD Floating User

From: Nancy Shelton
Sent: Tuesday, January 20, 2015 7:06 AM
To: Ian Tackett
Subject: FW: Invasive plants SR 88 H8112
Attachments: Plant survey H8112 SR 88.rtf

FYI

Thanks,
Nancy Shelton
Logan Simpson Design Inc.
480-967-1343

From: Michael Srogoncik [<mailto:MSrogoncik@azdot.gov>]
Sent: Tuesday, January 20, 2015 4:39 AM
To: Nancy Shelton
Cc: Lisa Andersen
Subject: FW: Invasive plants SR 88 H8112

Michael Srogoncik
Highway Operations Superintendent
2140 W. Hilton Ave
Phoenix, AZ 85009
602.571.8814

MSrogoncik@azdot.gov

http://adotnet/divisions/communications/graphic_standards/Logos/4email/adot_intermodal_email.jpg

Lisa Andersen
Friday, January 16, 2015 5:12 PM
Michael Srogoncik
Invasive plants SR 88 H8112

Lisa M. Andersen
District Environmental Coordinator
Arizona Department of Transportation
Phoenix Maintenance
2140 West Hilton Avenue
Phoenix, AZ. 85009
602.361.3227
Landersen@azdot.gov www.azdot.gov

Invasive plant survey for SR 88 H8112
Prepared by Lisa Andersen and Mike Srogoncik

Field survey completed January 13, 2015 on SR 88 from milepost 203.4 to 220.2 in Maricopa County, AZ. The project limits are primarily non-disturbed native plants to the Upper Sonoran desert. The following invasive species were observed.

Common name	Scientific name	Relative abundance: low, med, high	Notes
Bermuda grass	<i>Cynodon dactylon</i>	low	
Bufflegrass	<i>Cenchrus ciliaris</i>	low	
Spurge	<i>Euphorbia sp.</i>	low	
Tumbleweed	<i>Salsola tragus</i>	low	
Fountain grass	<i>Pennisetum setaceum</i>	low	
Johnson grass	<i>Sorghum halepense</i>	low	
Sahara Mustard	<i>Brassica tournefortii</i>	low	
Field bindweed	<i>Convolvulus arvensis</i>	low	



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arizona Ecological Services Field Office
2321 WEST ROYAL PALM ROAD, SUITE 103
PHOENIX, AZ 85021
PHONE: (602)242-0210 FAX: (602)242-2513
URL: www.fws.gov/southwest/es/arizona/;
www.fws.gov/southwest/es/EndangeredSpecies_Main.html



Consultation Code: 02EAAZ00-2014-SLI-0555

July 29, 2015

Event Code: 02EAAZ00-2015-E-00753

Project Name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/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 one or more delineated United States Geological Survey 7.5 minute quadrangles with which your project polygon intersects. Each quadrangle covers, at minimum, 49 square miles. Please refer to the species information links found at http://www.fws.gov/southwest/es/arizona/Docs_Species.htm or <http://www.fws.gov/southwest/es/arizona/Documents/MiscDocs/AZSpeciesReference.pdf> for a quick reference, 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" (e.g., downstream). If the Federal action agency determines that the action may jeopardize a *proposed* species or 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: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>.

In addition to species listed under the Act, we 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 (BGEPA) (16 U.S.C. 668 *et seq.*). Both laws prohibit the take of covered species. The list of MBTA-protected birds is in 50 CFR 10.13 (for an alphabetical list see <http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/MBTANDX.HTML>). The Service's Division of Migratory Birds is the lead for consultations under these laws (Southwest Regional Office phone number: 505/248-7882). For more information regarding the MBTA, BGEPA, and permitting processes, please visit the following web site: <http://www.fws.gov/migratorybirds/mbpermits.html>. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g. cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/southwest/es/arizona/CellTower.htm>

Although bald eagles (*Haliaeetus leucocephalus*) are no longer listed under the Act, they are protected under both the BGEPA and the MBTA. If a bald eagle nest occurs in or near the proposed project area, our office should be contacted. An evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles (see <http://www.fws.gov/southeast/es/baldeagle/>) and the Division of Migratory Birds consulted if necessary. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles (see <http://www.fws.gov/midwest/eagle/pdf/NationalBaldEagleManagementGuidelines.pdf>).

Activities that involve streams and/or wetlands are regulated by the U.S. Army Corps of Engineers (Corps). 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.

If your action is on Indian 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.

The State of Arizona protects some species not protected by Federal law. We recommend you contact the Arizona Game and Fish Department (AGFD) for animals and Arizona Department of Agriculture for plants to determine if species protected by or of concern to the State may occur in your action area. The AGFD has an Environmental Review On-Line Tool that can be accessed at <http://www.azgfd.gov/hgis/>. We also recommend that you coordinate with the AGFD regarding your project.

For additional communications regarding this project, please refer to the consultation Tracking Number in the header of this letter. We appreciate your concern for threatened and endangered species. If we may be of further assistance, please contact Brenda Smith at 928/556-2157 for projects in Northern Arizona, our general Phoenix number (602/242-0210) for central Arizona, or Jean Calhoun at 520/670-6150 (x223) for projects in southern Arizona.

Sincerely,

/s/

Steven L. Spangle

Field Supervisor

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

Official Species List

Provided by:

Arizona Ecological Services Field Office
2321 WEST ROYAL PALM ROAD, SUITE 103
PHOENIX, AZ 85021
(602) 242-0210
<http://www.fws.gov/southwest/es/arizona/>
http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html

Consultation Code: 02EAAZ00-2014-SLI-0555

Event Code: 02EAAZ00-2015-E-00753

Project Type: ** OTHER **

Project Name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

Project Description: This FHWA-funded safety improvement and pavement preservation project is located on SR 88 between MP 203.40 and MP 220.20, on the Tonto National Forest in the vicinity of Canyon Lake. Ground disturbance and minor vegetation removal will be required in various locations to reconstruct curves, reconstruct and add new guardrail, remove a large rock that is perched above the roadway, and repair the concrete ford across Tortilla Creek. The work is planned to occur in FY 2016 and last 6 months.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Maricopa, AZ



United States Department of Interior
Fish and Wildlife Service

Project name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

Endangered Species Act Species List

There are a total of 9 threatened, endangered, or candidate species on your 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. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
California Least tern (<i>Sterna antillarum browni</i>)	Endangered		
Mexican Spotted owl (<i>Strix occidentalis lucida</i>) Population: Entire	Threatened	Final designated	
Southwestern Willow flycatcher (<i>Empidonax traillii extimus</i>) Population: Entire	Endangered	Final designated	
Sprague's Pipit (<i>Anthus spragueii</i>)	Candidate		
Yellow-Billed Cuckoo (<i>Coccyzus americanus</i>) Population: Western U.S. DPS	Threatened	Proposed	
Fishes			
Gila topminnow (<i>Poeciliopsis occidentalis</i>) Population: U.S.A. only	Endangered		
Roundtail chub (<i>Gila robusta</i>) Population: Lower Colorado River Basin	Candidate		



United States Department of Interior
Fish and Wildlife Service

Project name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

DPS			
Mammals			
Lesser Long-Nosed bat (<i>Leptonycteris curasoae yerbabuenae</i>) Population: Entire	Endangered		
Reptiles			
Sonoran desert tortoise (<i>Gopherus morafkai</i>)	Candidate		



United States Department of Interior
Fish and Wildlife Service

Project name: STP 088 A(202)T; H8112; SR 88, Apache Junction to -- created on September 04, 2014 01:12

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Arizona Environmental Online Review Tool Report



Arizona Game and Fish Department Mission

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

Project Name:

Apache Junction to Tortilla Flat (H8112)

Project Description:

The scope of work would consist of: • Removing and replacing the pavement between MP 203.40 to MP 213.35, stabilizing the shoulders, and paving existing and new turnouts and pullouts • Applying a double seal coat on the existing roadway and paved turnouts and pullouts between MP 213.35 and MP 220.20 (including the low-water crossing at Mesquite Creek) • Stabilizing the edge of the pavement throughout the project area by installing a safety edge • Reconstructing the curves at the following locations: o Curve 1 – MP 203.40 to MP 203.60 o Curve 2 – MP 204.24 to MP 204.36 o Curve 3 – MP 204.43 to MP 204.53 o Curve 4 – MP 206.32 to MP 206.50 o Curve 5 – MP 208.20 to MP 208.50 o Curve 6 – MP 210.40 to MP 210.50 • Modifying existing culverts, as needed to accommodate the reconstructed curves • Removing a large rock spire above the road at MP 212.70 • Repairing the eastbound approach at the Boulder Canyon Bridge (MP 211.05) by removing and replacing 100 feet of pavement • Repairing the concrete ford across Tortilla Creek near Tortilla Flat (MP 213.3) • Constructing spot repairs of the roadway at the following locations: o MP 218.70 WB lane o MP 219.10 EB lane o MP 219.20 EB lane o MP 219.60 WB lane • Reconstructing existing guardrail and constructing approximately 355 feet of new guardrail at various locations to meet current standards • Installing new signs including a dynamic message sign and camera at WB MP 211.10 • Marking/stripping the roadway • Controlling weeds using chemical and manual methods, as appropriate

Project Type:

Transportation & Infrastructure, Road construction (including staging areas), Realignment/new roads

Contact Person:

Ian Tackett

Organization:

Logan Simpson Design Inc.

On Behalf Of:

CONSULTING

Project ID:

HGIS-01275

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

Disclaimer:

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

Locations Accuracy Disclaimer:

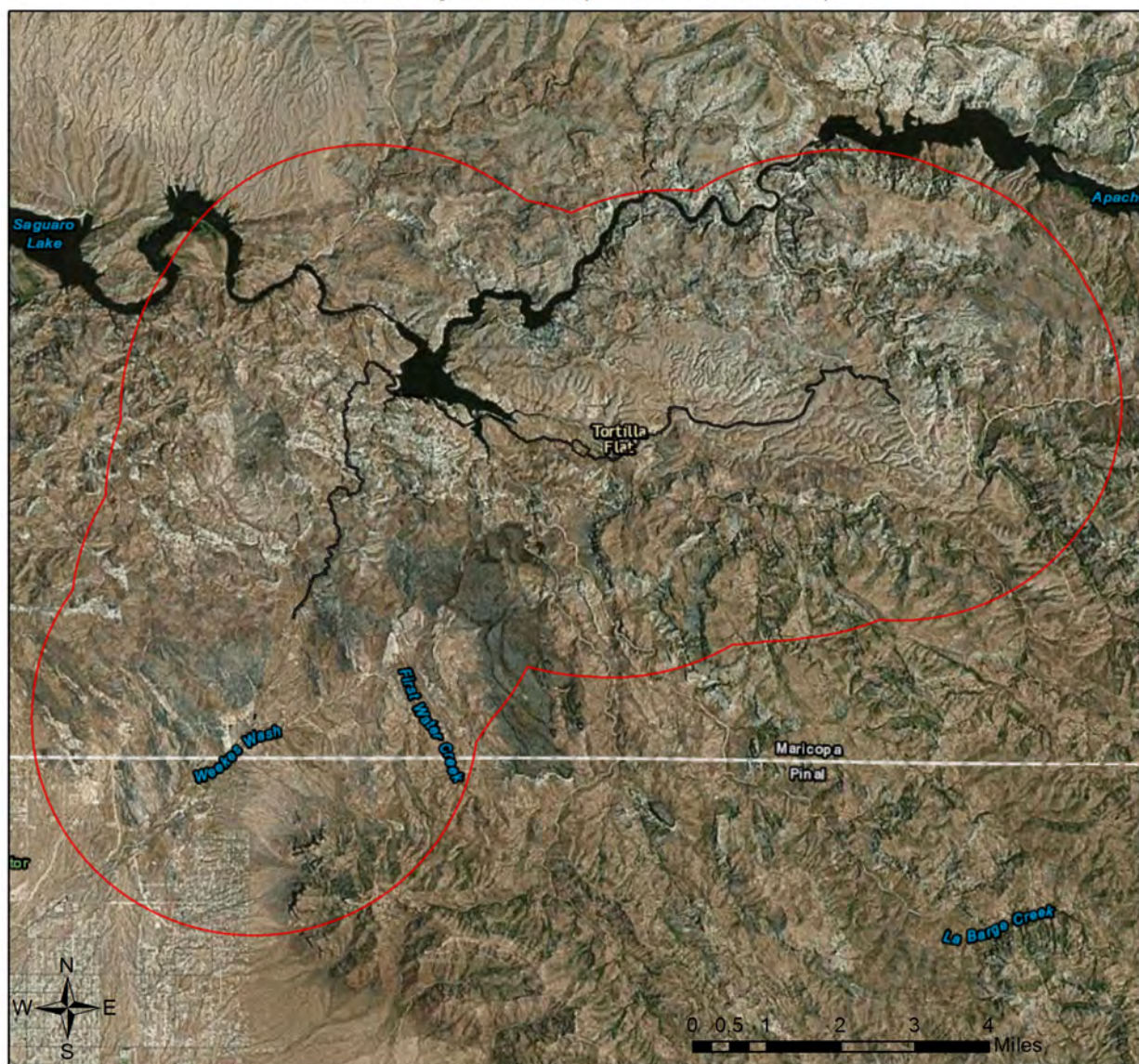
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

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

Apache Junction to Tortilla Flat (H8112)

Aerial Image Basemap With Locator Map



- Project Boundary
- Buffered Project Boundary

Project Size (acres): 137.94

Lat/Long (DD): 33.5353 / -111.4310

County(s): Maricopa

AGFD Region(s): Mesa

Township/Range(s): T2N, R9E; T2N, R10E

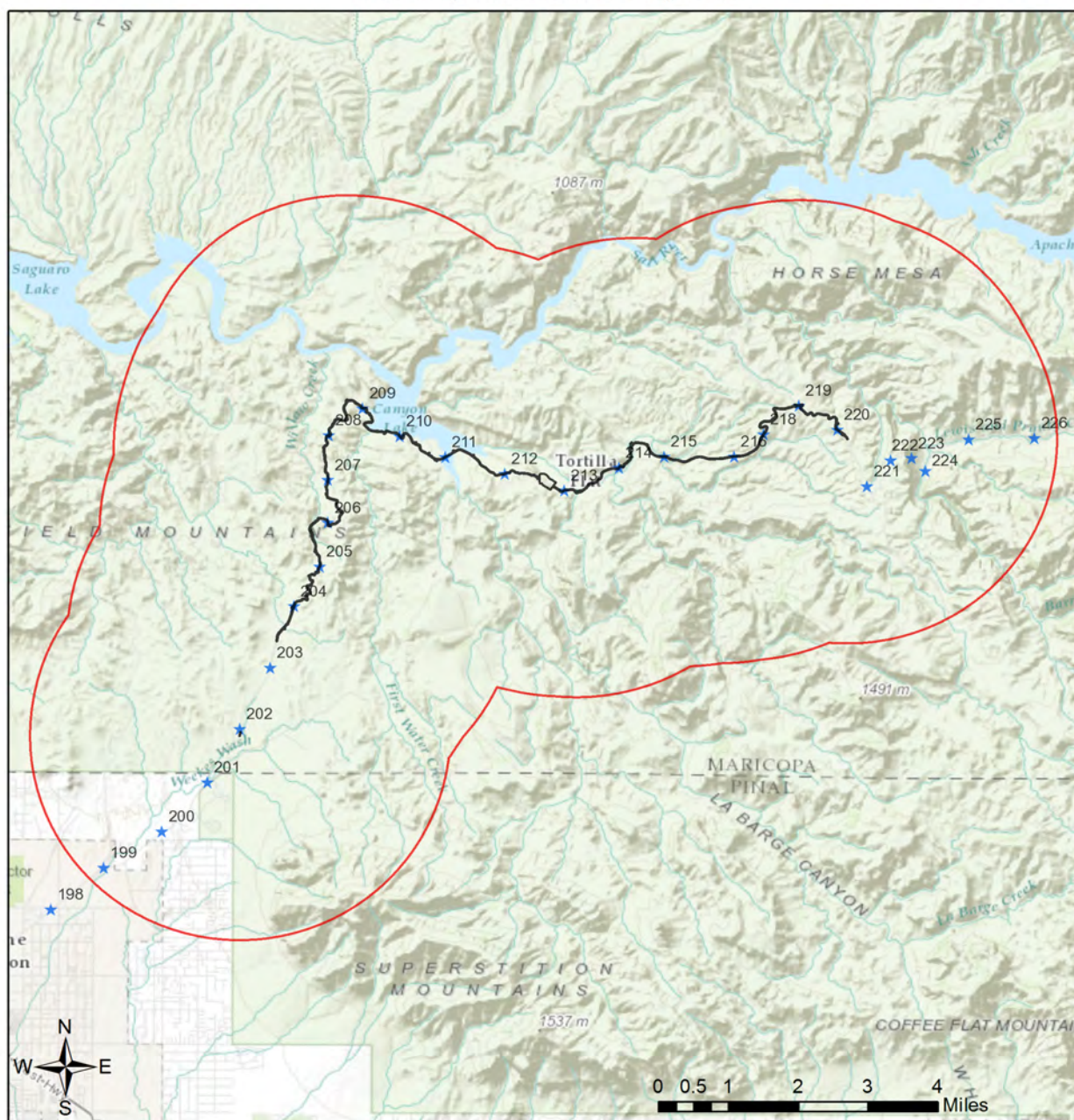
USGS Quad(s): MORMON FLAT DAM; HORSE MESA DAM +

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong),



Apache Junction to Tortilla Flat (H8112)

Web Map As Submitted By User



-  Project Boundary
-  Buffered Project Boundary
-  Milepost

Project Size (acres): 137.94

Lat/Long (DD): 33.5353 / -111.4310

County(s): Maricopa

AGFD Region(s): Mesa

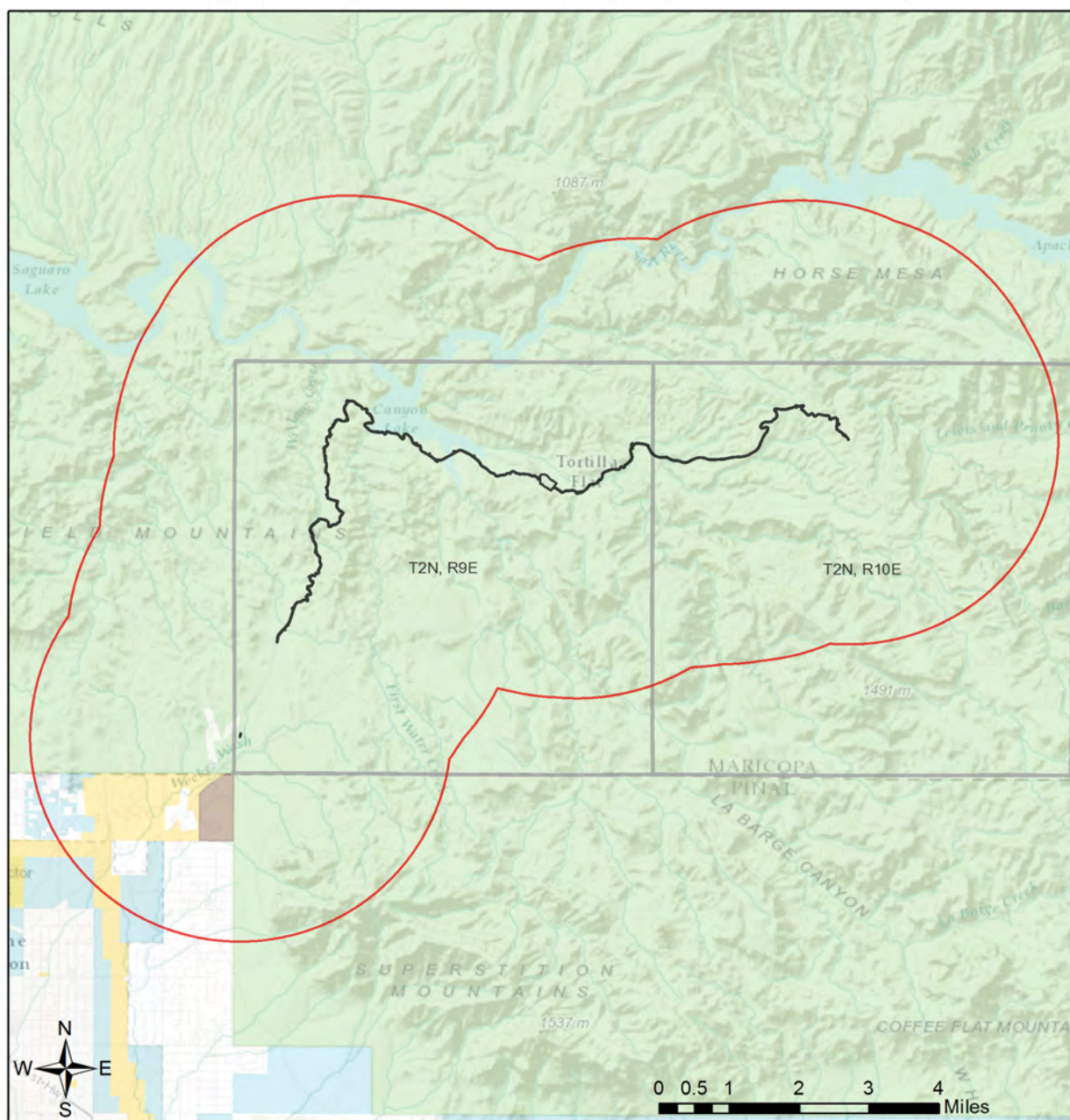
Township/Range(s): T2N, R9E; T2N, R10E

USGS Quad(s): MORMON FLAT DAM; HORSE MESA DAM +

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Apache Junction to Tortilla Flat (H8112)

Topo Basemap With Township/Ranges and Land Ownership



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

Project Size (acres): 137.94
 Lat/Long (DD): 33.5353 / -111.4310
 County(s): Maricopa
 AGFD Region(s): Mesa
 Township/Range(s): T2N, R9E; T2N, R10E
 USGS Quad(s): MORMON FLAT DAM; HORSE MESA DAM +

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Special Status Species and Special Areas Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Abutilon parishii	Pima Indian Mallow	SC	S	S	SR	
Agosia chrysogaster chrysogaster	Gila Longfin Dace	SC		S		1B
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Bat Colony						
Canis lupus baileyi	10J area Zone 1 for Mexican gray wolf	LE,XN				
Canis lupus baileyi	10J area Zone 2 for Mexican gray wolf	LE,XN				
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S		1A
Gopherus morafkai	Sonoran Desert Tortoise	C*	S			1A
Haliaeetus leucocephalus (wintering pop.)	Bald Eagle - Winter Population	SC,BG A	S	S		1A
Haliaeetus leucocephalus pop. 3	Bald Eagle - Sonoran Desert Population	SC,BG A	S	S		1A
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1A
Lotus alamosanus	Alamos Deer Vetch		S			
Lupinus huachucanus	Huachuca Mountain Lupine		S			
Mabrya acerifolia	Mapleleaf False Snapdragon		S			
Macrotus californicus	California Leaf-nosed Bat	SC		S		1B
Poeciliopsis occidentalis occidentalis	Gila Topminnow	LE				1A

Note: Status code definitions can be found at http://www.azgfd.gov/w_c/edits/hdms_status_definitions.shtml.

**Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Agosia chrysogaster	Longfin Dace	SC		S		1B
Aix sponsa	Wood Duck					1B
Ammodramus savannarum perpallidus	Western Grasshopper Sparrow					1B
Ammospermophilus harrisi	Harris' Antelope Squirrel					1B
Anthus spragueii	Sprague's Pipit	C*				1A
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Aspidoscelis flagellicauda	Gila Spotted Whiptail					1B
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Castor canadensis	American Beaver					1B
Chilomeniscus stramineus	Variable Sandsnake					1B
Chionactis occipitalis klauberi	Tucson Shovel-nosed Snake	SC				1A
Coccyzus americanus occidentalis						
Colaptes chrysoides	Gilded Flicker			S		1B
Coluber bilineatus	Sonoran Whipsnake					1B

**Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Crotalus cerberus	Arizona Black Rattlesnake					1B
Crotalus tigris	Tiger Rattlesnake					1B
Dipodomys spectabilis	Banner-tailed Kangaroo Rat			S		1B
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S		1A
Gopherus morafkai	Sonoran Desert Tortoise	C*	S			1A
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus blossevillii	Western Red Bat		S			1B
Lasiurus xanthinus	Western Yellow Bat		S			1B
Leopardus pardalis	Ocelot	LE				1A
Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	LE				1A
Lepus alleni	Antelope Jackrabbit					1B
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1A
Macrotus californicus	California Leaf-nosed Bat	SC		S		1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolni	Lincoln's Sparrow					1B
Melospiza aberti	Abert's Towhee		S			1B
Micruroides euryxanthus	Sonoran Coralsnake					1B
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Odocoileus virginianus	White-tailed Deer					1B
Ovis canadensis nelsoni	Desert Bighorn Sheep					1B
Panthera onca	Jaguar	LE				1A
Passerculus sandwichensis	Savannah Sparrow					1B
Perognathus amplus	Arizona Pocket Mouse					1B
Phrynosoma solare	Regal Horned Lizard					1B
Phyllorhynchus browni	Saddled Leaf-nosed Snake					1B
Poeciliopsis occidentalis occidentalis	Gila Topminnow	LE				1A
Progne subis hesperia	Desert Purple Martin			S		1B
Setophaga petechia	Yellow Warbler					1B
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Toxostoma lecontei	Le Conte's Thrasher					1B

**Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Troglodytes pacificus	Pacific Wren					1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	Kit Fox					1B
Xantusia bezyi	Bezy's Night Lizard		S			1B

Species of Economic and Recreation Importance Predicted within Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Odocoileus hemionus	Mule Deer					
Odocoileus virginianus	White-tailed Deer					1B
Ovis canadensis mexicana	Mexican Desert Bighorn Sheep					1B
Patagioenas fasciata	Band-tailed Pigeon					1C
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Ursus americanus	American Black Bear					
Zenaida asiatica	White-winged Dove					

Project Type: Transportation & Infrastructure, Road construction (including staging areas), Realignment/new roads

Project Type Recommendations:

Bridge Maintenance/Construction Identify whether wildlife species use the structure for roosting or nesting during anticipated maintenance/construction period. Plan the timing of maintenance/construction to minimize impacts to wildlife species. In addition to the species list generated by the Arizona's On-line Environmental Review Tool, the Department recommends that surveys be conducted at the bridge and in the vicinity of the bridge to identify additional or currently undocumented bat, bird, or aquatic species in the project area. To minimize impacts to birds and bats, as well as aquatic species, consider conducting maintenance and construction activities outside the breeding/maternity season (breeding seasons for birds and bats usually occur spring - summer). Examining the crevices for the presence of bats prior to pouring new paving materials or that the top of those crevices be sealed to prevent material from dripping or falling through the cracks and potentially onto bats. If bats are present, maintenance and construction (including paving and milling) activities should be conducted during nighttime hours, if possible, when the fewest number of bats will be roosting. Minimize impacts to the vegetation community. Unavoidable impacts to vegetation should be mitigated on-site whenever possible. A revegetation plan should be developed to replace impacted communities. Consider design structures and construction plans that minimize impacts to channel geometry (i.e., width/depth ratio, sinuosity, allow overflow channels), to avoid alteration of hydrological function. Consider incorporating roosting sites for bats into bridge designs. During construction, erosion control structures and drainage features should be used to prevent introduction of sediment laden runoff into the waterway. Minimize instream construction activity. If culverts are planned, use wildlife friendly designs to mitigate impacts to wildlife and fish movement. Guidelines for bridge designs to facilitate wildlife passage can be found on the home page of this application at <http://www.azgfd.gov/hgis/guidelines.aspx>.

Fence recommendations will be dependant upon the goals of the fence project and the wildlife species expected to be impacted by the project. General guidelines for ensuring wildlife-friendly fences include: barbless wire on the top and bottom with the maximum fence height 42", minimum height for bottom 16". Modifications to this design may be considered for fencing anticipated to be routinely encountered by elk, bighorn sheep or pronghorn (e.g., Pronghorn fencing would require 18" minimum height on the bottom). Please refer to the Department's Fencing Guidelines located on the home page of this application at <http://www.azgfd.gov/hgis/guidelines.aspx>.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, cantered, or cut to ensure that light reaches only areas needing illumination.

Minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g., microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g., livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants, <https://agriculture.az.gov/>. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control, <http://www.usda.gov/wps/portal/usdahome>. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml

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

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

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

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefuna (snakes, lizards, tortoise) from entering ditches.

Design culverts to minimize impacts to channel geometry, or design channel geometry (low flow, overbank, floodplains) and substrates to carry expected discharge using local drainages of appropriate size as templates. Reduce/minimize barriers to allow movement of amphibians or fish (e.g., eliminate falls). Also for terrestrial wildlife, washes and stream corridors often provide important corridors for movement. Overall culvert width, height, and length should be optimized for movement of the greatest number and diversity of species expected to utilize the passage. Culvert designs should consider moisture, light, and noise, while providing clear views at both ends to maximize utilization. For many species, fencing is an important design feature that can be utilized with culverts to funnel wildlife into these areas and minimize the potential for roadway collisions. Guidelines for culvert designs to facilitate wildlife passage can be found on the home page of this application at <http://www.azgfd.gov/hgis/guidelines.aspx>.

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

Based on the project type entered, coordination with U.S. Army Corps of Engineers may be required (<http://www.usace.army.mil/>)

Based on the project type entered, coordination with County Flood Control district(s) may be required.

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

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

Project Location and/or Species Recommendations:

HDMS records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area. Please contact:

Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373

<https://agriculture.az.gov/environmental-services/np1>

HDMS records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at <http://www.fws.gov/southwest/es/arizona/> or:

Phoenix Main Office

2321 W. Royal Palm Rd, Suite 103
Phoenix, AZ 85021
Phone: 602-242-0210
Fax: 602-242-2513

Tucson Sub-Office

201 N. Bonita Suite 141
Tucson, AZ 85745
Phone: 520-670-6144
Fax: 520-670-6155

Flagstaff Sub-Office

SW Forest Science Complex
2500 S. Pine Knoll Dr.
Flagstaff, AZ 86001
Phone: 928-556-2157
Fax: 928-556-2121

HDMS records indicate that Sonoran Desert Tortoise have been documented within the vicinity of your project area. Please review the Tortoise Handling Guidelines found at:

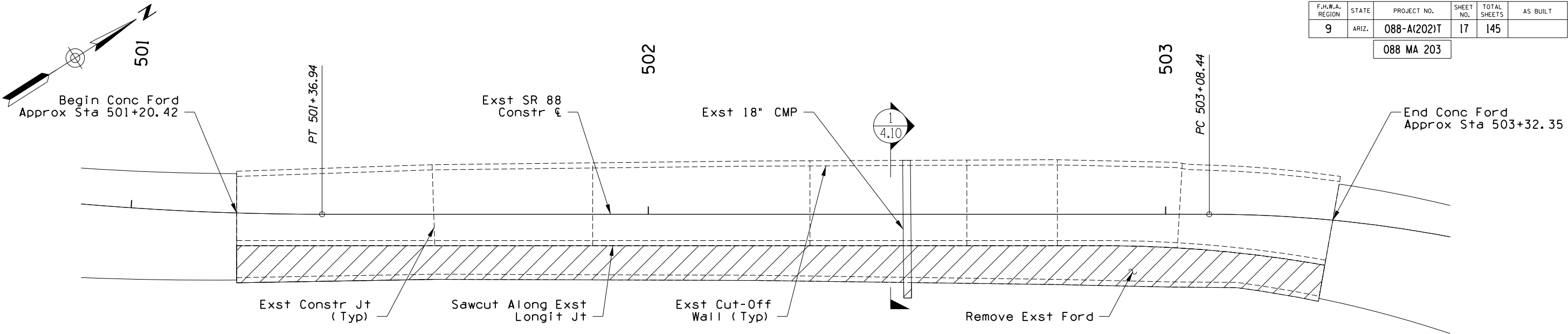
<http://www.azgfd.gov/hgis/pdfs/Tortoisehandlingguidelines.pdf>

Appendix D

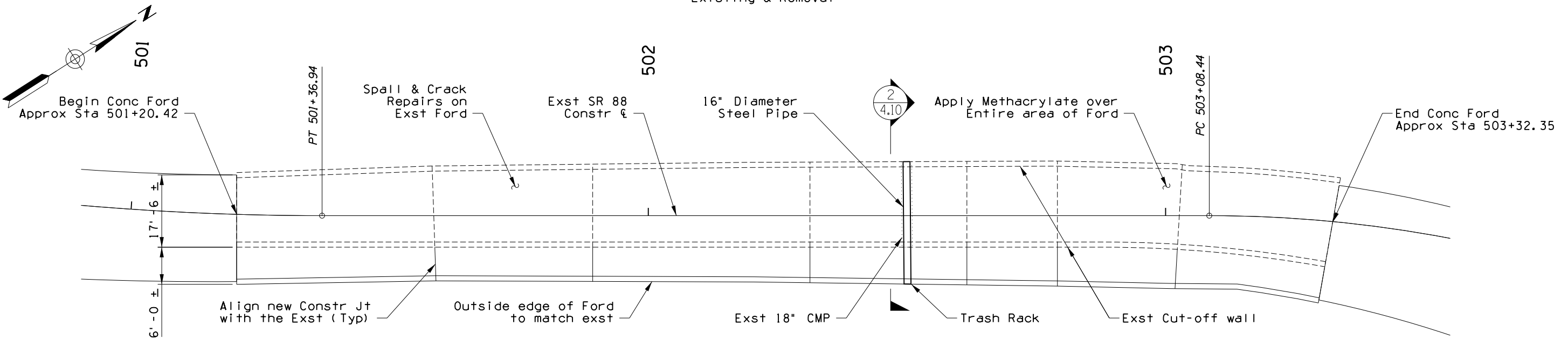
Project Plan Excerpts and Exhibits

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	088-A(202)T	17	145	

088 MA 203



PLAN
Existing & Removal



PLAN
Proposed

APPROXIMATE QUANTITIES
(For Contractor's Information Only)

* Class "S" Concrete (f'c=3,500)	CY	61
* Reinforcing Steel	LBS	6,580
Structure Backfill	CY	45
Steel Pipe	LF	25
Methacrylate	SF	4,985
Crack Repair	LF	325
Spall Repair	SF	20

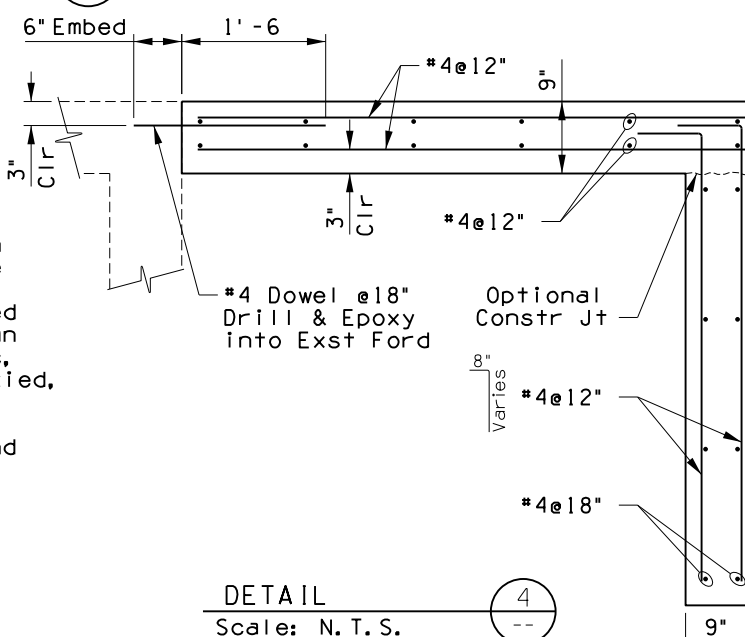
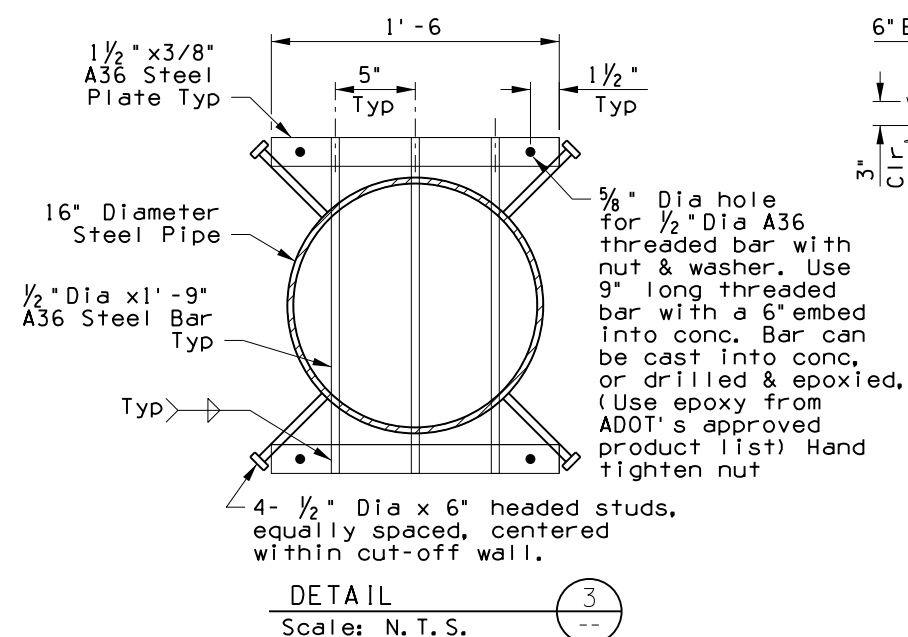
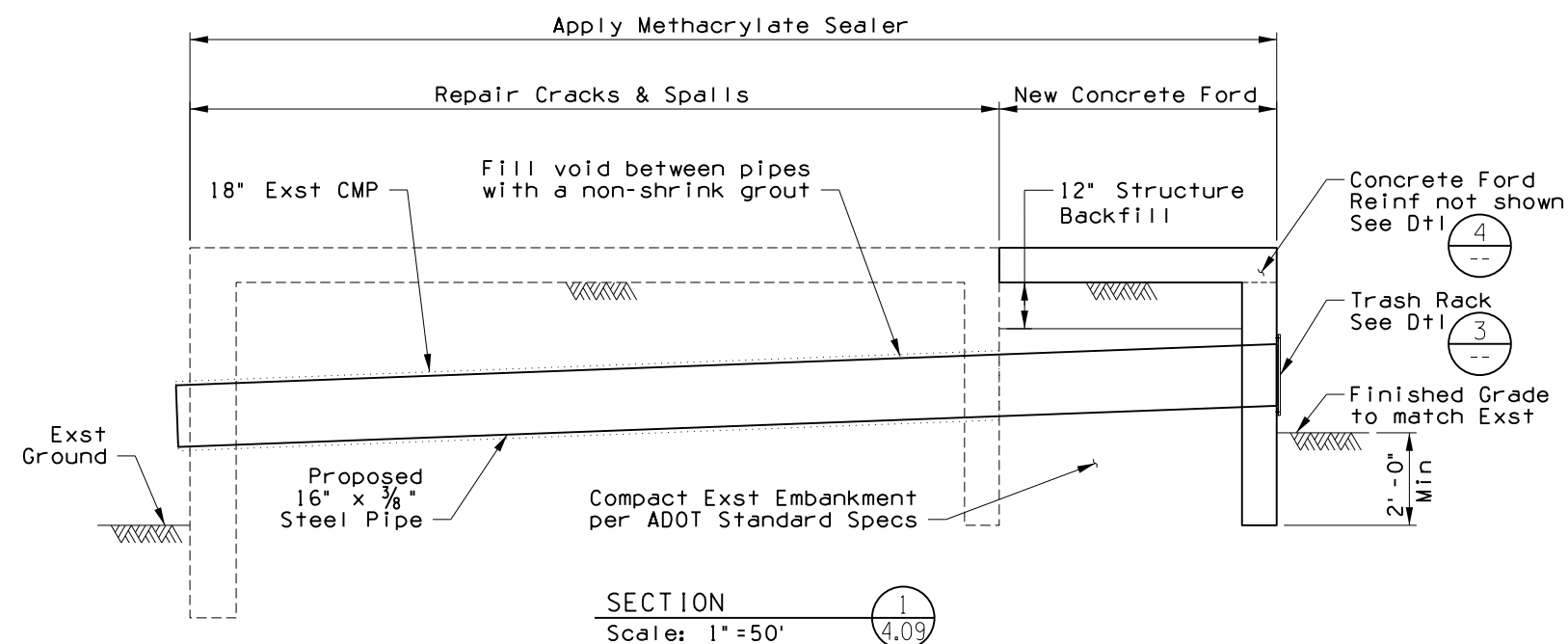
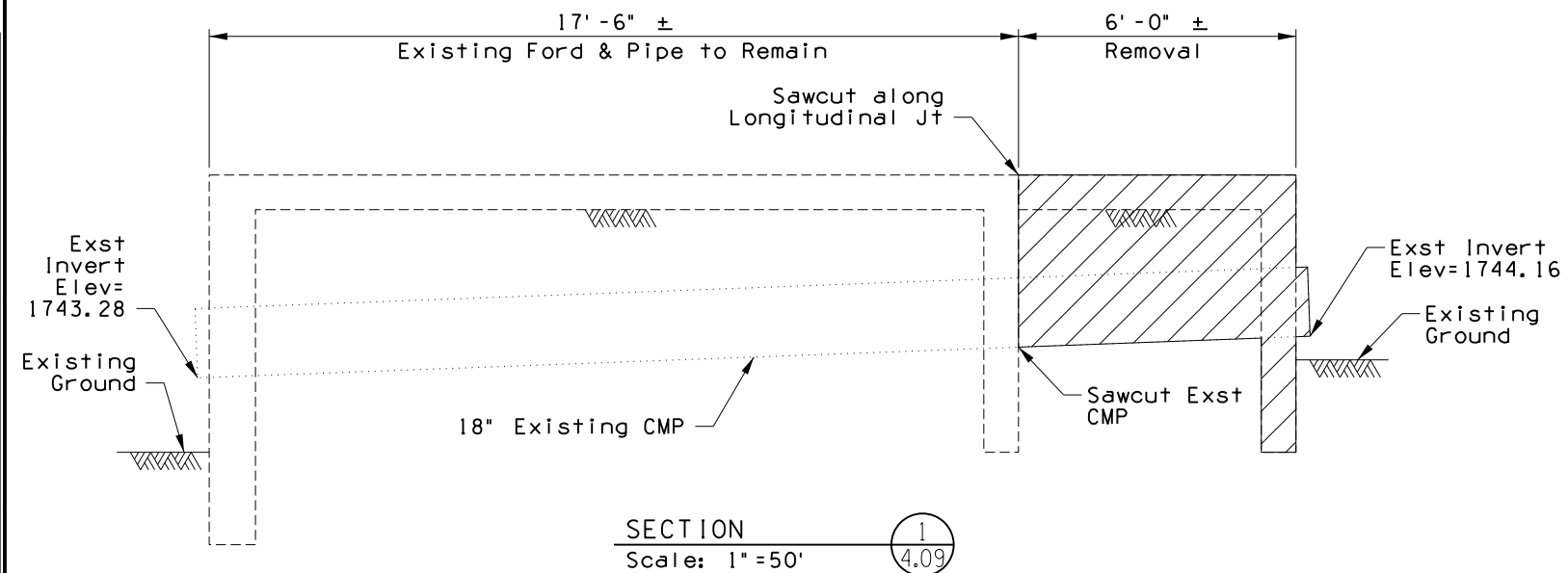
* Assumes an average distance of 5'-0" from top of Ford to bottom of cut-off wall.

DETAIL C CONCRETE FORD - SHEET 1 OF 2

		NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	PRELIMINARY STAGE III Review NOT FOR CONSTRUCTION OR RECORDING DWG. NO. G-04.09
DESIGN	JAC		12/14		
DRAWN	MMF		12/14		
CHECKED	DJL		12/14		
Michael Baker INTERNATIONAL				DETAIL SHEET DETAIL C (1 OF 2)	CONSTRUCTION OR RECORDING DWG. NO. G-04.09 OF
ROUTE		LOCATION			
SR 88		APACHE JUNCTION TO TORTILLA FLAT			
TRACS NO. H8112 OIC				088-A(202)T	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	088-A(202)T	18	145	

088 MA 203



Concrete Ford Notes

All concrete shall be Class "S" (f'c = 3,500 psi).
Reinforcing steel shall conform to ASTM Specification
A615. All reinforcing steel shall be furnished as Grade 60.
All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10.
All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement
dimensions for reinforcing steel shall be to center of bars unless noted otherwise.
All reinforcing steel shall have 2" clear cover unless noted otherwise.
Chamfer all exposed corners $\frac{3}{4}$ " unless noted otherwise.
Epoxy for dowel bars shall be selected from ADOT's approved products list.
Prior to removing the approximately 6'-0" portion of the ford, the contractor
shall survey the existing top edge of concrete and existing ground. The new portion
of the ford shall be constructed to the same elevations.
At construction joints, extend all horizontal bars 1'-6" beyond the joint. Lap
length for all horizontal bars shall be 1'-8".
Methacrylate sealer shall be applied to the full width of the ford after the spall and
crack materials have cured. See special provisions for additional information.

Pipe Installation Notes

Steel pipe shall conform to the requirements of ASTM A53, Grade B, Type E or S. Steel pipe & trash rack shall be galvanized per ASTM A123. Trash rack hardware shall be galvanized per ASTM A153.

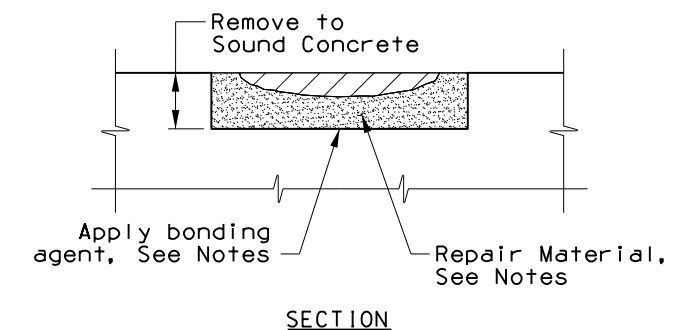
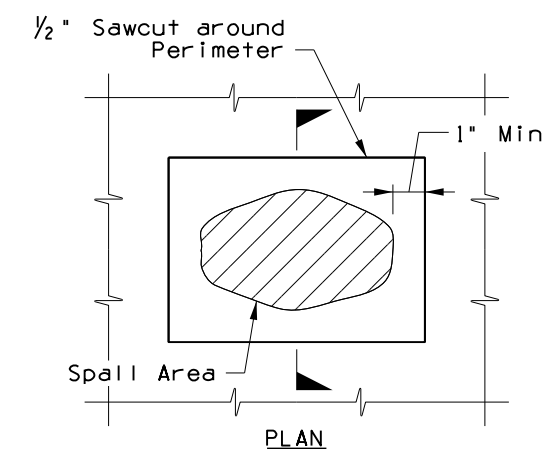
Prior to installation of new steel pipe, existing pipe shall be cleaned out of all rocks and debris in a manner that does not damage the existing pipe.

Contractor shall ensure that the pipe wall thickness is sufficient to withstand the forces they will be exerting on the pipe during installation.

Contractor shall pressure inject grout between the existing and new pipes in such a manner to ensure the void is completely filled.

Crack & Spall Repair Notes

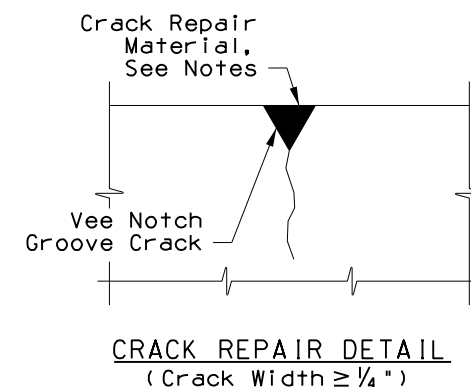
Crack repair material shall be one of the following, or an approved equal:
 Sikadur 52 by Sika Corp, OR Sikadur 35 Hi-Mod LV by Sika Corp, OR
 Crackbond LR321 by Adhesives Technology
 Spall repair material shall be one of the following, or an approved equal:
 SikaTop 111 Plus by Sika Corp., OR SikaTop 123 Plus by Sika Corp., OR
 Sealtight Meadow-Crete FNP by W.R. Meadows, Inc.
 Surface preparation and placement of spall and crack repair materials shall
 be per the manufacturers recommendations.
 Bonding Agent Material Shall be from ADOT approved products list (Category A-2)



SPALL REPAIR DETAIL

DETAIL C

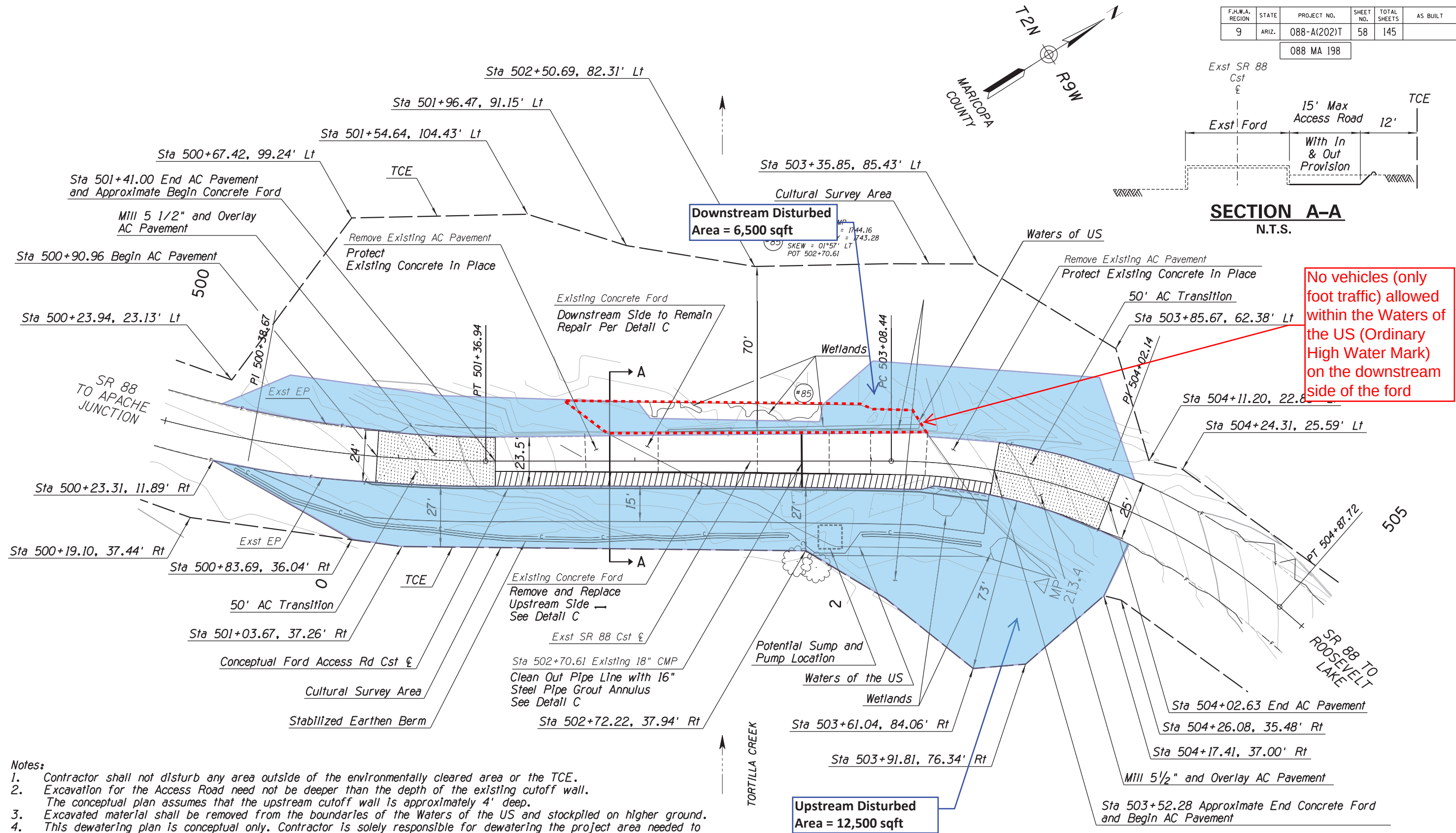
CONCRETE FORD - SHEET 2 OF 2



		NAME		DATE		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES		PRELIMINARY STAGE III Review NOT FOR CONSTRUCTION OR RECORDING	
DESIGN	JAC			12/14					
DRAWN	MMF			12/14					
CHECKED	DJL			12/14					
						DETAIL SHEET DETAIL C (2 OF 2)		DWG. NO. G-04.10	
ROUTE		LOCATION							
SR 88		APACHE JUNCTION TO TORTILLA FLAT						_____ <i>OF</i> _____	
TRACS NO. H8112 OIC						088-A(202)T			

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	088-A(202)T	58	145	
088 MA 198					



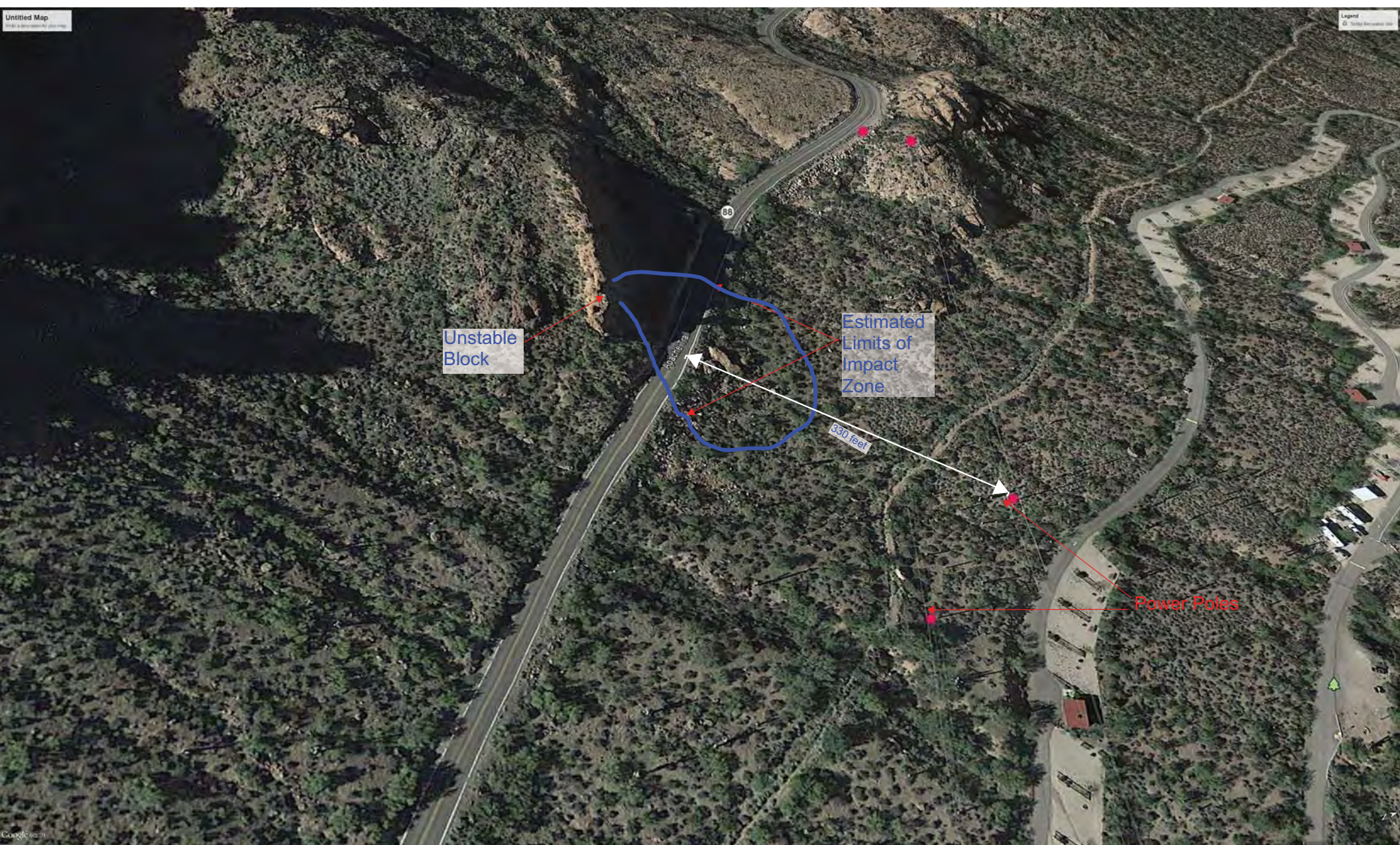
SECTION A-A
N.T.S.

No vehicles (only foot traffic) allowed within the Waters of the US (Ordinary High Water Mark) on the downstream side of the ford

No work or entry will be allowed outside the blue area at the Tortilla Creek ford (other than on the pavement).

- Notes:
- Contractor shall not disturb any area outside of the environmentally cleared area or the TCE.
 - Excavation for the Access Road need not be deeper than the depth of the existing cutoff wall. The conceptual plan assumes that the upstream cutoff wall is approximately 4' deep.
 - Excavated material shall be removed from the boundaries of the Waters of the US and stockpiled on higher ground.
 - This dewatering plan is conceptual only. Contractor is solely responsible for dewatering the project area needed to complete the construction of the ford.
 - Contractor is responsible for obtaining and maintaining all required permits necessary to complete the construction of the ford.
 - The Access Road backslope shall be stabilized to prevent erosion.
 - Conceptual plan assumes water to be collected in a sump area and/or with a French Drain, however the contractor is responsible for final approved dewatering plans
 - After construction, stockpiled material shall be replaced to the grade condition at the start of construction
 - No construction debris will be allowed to enter the waters of the US including grout when grouting annular space around culvert pipe. Contractor shall take extra precaution during construction.
 - A vent hole will not be required during grouting operations.

DESIGN	EPC	DATE	3/15	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	PRELIMINARY DRAFT Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	WDF	DATE	3/15		
CHECKED	AME	DATE	3/15		
Michael Baker INTERNATIONAL				PREFERRED ALTERNATIVE CONCRETE FORD	DWG. NO. C-02.21 OF
ROUTE 88 LOCATION				APACHE JUNCTION TO SR 188	
TRACS NO. H8112 OIC				088-A(202)T	



Unstable
Block

Estimated
Limits of
Impact
Zone

330 feet

Power Poles

Appendix E

Arizona Game and Fish Department Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (Revised October 23, 2007)

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

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

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

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

Please keep in mind the following points:

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