088-H(202) FI

United States Department of the Interior

U.S. Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue
Phoenix, AZ 85051
Telephone: (602) 242-0210 Fax: (602) 242-2513

In reply refer to:
AESO/SE
02EAAZ00-2014-F-0555

JUN 23 2016

June 21, 2016

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

Re. SR 88 Apache Junction to Forest Road 213 Road Improvement Project
FHWA File # HSIP-088-A(202)
ADOT File # 088-MA-203-H8112-01C

Dear Ms. Petty:

Thank you for your correspondence and request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated August 6, 2015 and was received by us via electronic mail (email) on August 7, 2015. The biological evaluation (BE) for the proposed action, dated July 29, 2015, was also received on August 7, 2015. At issue are the possible effects of safety improvements and pavement preservation efforts along State Route 88, near Canyon Lake, Maricopa County, Arizona, on the endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*) (topminnow). Your letter concluded that the proposed action "may affect, and is likely to adversely affect" the topminnow.

Your request of August 6, 2015 also concluded that the project "may impact individuals, but is not likely to cause a trend toward federal listing or loss of viability" for the Sonoran desert tortoise (*Gopherus morafkai*) (tortoise), a candidate species at the time you sent the consultation request. In your letter, you requested technical assistance to reduce project impacts on this species. On October 6, 2015, we removed this species from the candidate list (80 FR 60321), and as a result, there is no requirement to consult with FWS on this species at this time. Note that the Arizona Department of Transportation (ADOT) is a signatory to a Candidate Conservation Agreement (CCA) for the tortoise, issued in May 2015. Pursuant to that agreement, ADOT has agreed to a number of conservation actions on behalf of the tortoise, as outlined on page 49 of the CCA. The CCA is available on our website (http://www.fws.gov/southwest/es/arizona/Conservation_Agreements.htm).

This biological opinion (BO) is based on information provided in the July 29, 2015 BE, email correspondence, telephone conversations, and other sources of information found in the administrative record supporting this biological opinion. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, the effects of roadway improvement projects on those species, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office (file number 02EAAZ00-2014-F-0555).

CONSULTATION HISTORY

May 7, 2015	We received the draft BE for this project, dated May 5, 2015, with a request for our review and comments.
June 17, 2015	We sent our comments on the draft BE.
August 7, 2015	We received the final BE for this project, dated July 29, 2015, and your request for formal consultation.
December 10, 2015	We received ADOT's draft fish salvage protocol for the Gila topminnow.
February 19, 2016	We provided comments on ADOT's draft fish salvage protocol.
April 15, 2016	We received a second draft of the fish salvage protocol.
April 20, 2016	We sent you the draft BO.
May 26, 2016	We received the final fish salvage protocol.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed project would be constructed by ADOT, using funding provided through the Federal Highway Administration (FHWA). The following summary of the proposed action is taken from the BE. Maps, photographs, and diagrams of the action area are included in the BE and are incorporated herein by reference. Throughout the BE, the term "project limits" is used to represent the construction footprint (area of disturbance). The project limits are defined in the BE as the 30-foot (ft)-wide corridor on either side of the SR 88 centerline, between milepost (MP) 203.40 and MP 220.20 (Figure 1). The project limits also include five construction staging areas, six curve reconstruction locations, a rock spire removal area, a ford reconstruction site where SR 88 crosses Tortilla Creek, and numerous existing turnouts and pullouts along the roadway, all of which extend outside the 30-ft-wide corridor on either side of the SR 88 centerline. The project limits also include a low-water crossing of Mesquite Creek, a tributary of Tortilla Creek. The project would occur entirely on lands managed by the U.S. Forest Service, Tonto National Forest (TNF).

Within the project limits, SR 88 is a two-lane undivided highway consisting of one 11-foot-wide travel lane in each direction with no shoulders. Sections of the roadway have inconsistent curves that force motorists to make sudden steering adjustments and many sections of the roadway have eroded or have steep edges along the pavement. The rock spire, located approximately 50 ft south of the roadway and 100 ft above the roadway, shows signs of cracking and erosion at its base creating a rockfall hazard. The paved surface of SR 88 has degraded due to weathering and years of use, and 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 these safety issues and maintain the integrity of the roadway surface and related infrastructure.

Although much of the work would take place on existing paved surfaces, overall approximately 19.5 acres of ground disturbance and vegetation removal would occur during this project. Herbicides would be used as appropriate to control weeds along the roadway using chemical and manual methods of removal. Below, we describe in greater detail those elements of the proposed action that would have direct or indirect effects on the Gila topminnow. These include, in particular, pavement preservation from MP 213.5 to MP 220.20, which would include resurfacing the low-water crossing of Mesquite Creek, and ford reconstruction at the Tortilla Creek ford crossing. The work at the ford crossing would require dewatering of the work site and capture and relocation of topminnows prior to dewatering.

Pavement Preservation

Pavement preservation from MP 213.35 to MP 220.20, including the low-water crossing of Mesquite Creek, would consist of two applications of seal coat over the existing pavement. The sequence of activities during application of the double seal coat would consist of: 1) application of bituminous material for the chip seal; 2) spreading and compaction of the cover material (clean sand, gravel or crushed rock); 3) curing; 4) brooming excess cover material; 5) application of 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. Initial curing of the newly-applied chip seal coat occurs within hours of its application. Curing is complete within 30–60 days.

Reconstruction of the Tortilla Creek Ford Crossing

The existing ford crossing is 23.5 ft wide and includes a 17.5-ft-wide section on the downstream side that originally served as a one-lane crossing. A six-ft-wide section on the upstream side was added later to create a two-lane crossing. Work at the ford crossing is expected to take approximately six weeks and would involve the following actions:

- Dewater the creek as necessary (see section below).
- Repair existing cracks and spalls on the downstream side of the ford.
- Remove the six-foot-wide section on the upstream side of the ford and replace it with a new reinforced concrete roadway with cut-off walls.
- Install a new steel pipe (15-inch) within the existing damaged 18-inch corrugated metal pipe culvert under the crossing.

- Apply a methacrylate sealer to the top and upstream face of the ford after concrete has dried
- Restore the upstream area to pre-construction conditions and allow vegetation to re-establish naturally.

Access to the ford work area would require grading within and adjacent to the stream channel on the upstream side of the ford using an excavator. Vegetation including several Goodding's willow (*Salix gooddingii*) and small patches of wetland vegetation, including buttonbush (*Cephalanthus occidentalis*) and giant reed (*Arundo donax*), would be removed upstream of the ford. Aquatic vegetation in a bedrock-constrained perennial pool immediately below the ford would also be removed or would die when the pool is drained.

Only foot traffic would be allowed within the low flow channel on the downstream side of the ford. Heavy equipment would access the upstream work area to remove the portion of the ford that needs to be replaced. The existing culvert pipe would be cleared of debris using hydrovac trucks. These trucks are designed to flush material from an excavation site using pressurized jets of water, and to vacuum the loosened material into a holding tank on the truck through a heavy hose. Hydrovacs would be parked within designated work areas, including the ford itself, the upstream side of the ford, and the downstream side of the ford outside of the channel. The hydrovacs would be operated at each end of the pipe simultaneously during flushing to minimize discharge of material or water.

When the new culvert pipe is in place, wooden forms for the upstream cutoff wall and the top of the new ford section would be built and filled with concrete. Concrete trucks would be located in work areas as described above. Concrete would be allowed to cure for at least 24 hours before removal of the forms. Methacrylate sealant would be applied to the upstream surface of the ford (the cut-off wall) before allowing the structure to come into contact with surface water. Once patch materials used on spalls and cracks have cured, the top of the ford would be coated with a methacrylate sealant. To prevent methacrylate from entering the channel or surface water of Tortilla Creek, the methacrylate would be applied during clear weather when surface flows are not likely to occur. Methacrylate dries within two to four hours and provides effective protection against the leaching of alkaline pore water from curing concrete into surface waters, which can be harmful to aquatic organisms (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 best management practices (BMPs) for storm water and erosion control.

Dewatering of Tortilla Creek

If surface flows are present when work at the ford is scheduled to begin, the work area directly adjacent to the upstream side of the ford would be dewatered. The permanent pool directly below the ford may be drained to allow access to the downstream section of the ford, even if surface flows are not present.

Repairs to the ford are expected to occur during the months of April through June when flows in Tortilla Creek are likely to be very low or absent. Rains are infrequent during those months but could occur, in which case surface flows could enter the work area during construction. For that reason, the contractor responsible for repairs to the ford would be required to submit a plan to ADOT outlining methods for managing water in Tortilla Creek throughout the construction period (six weeks). The water management plan would be required to address the following concerns:

- The sequence and schedule for dewatering and re-watering.
- As applicable, methods to isolate the work area from the active stream flow.
- As applicable, methods to route and convey stream flow around or through the isolated work area.
- As applicable, methods to de-water the isolated work area.
- Methods to pump water downstream of the ford.
- Specifications for on-site backup materials and equipment in the event that surface flows occur after construction begins.
- Calculations of water pump capacity.

Prior to construction, it may be necessary to block flows across the entire stream channel, or a portion of it, and redirect flows to a sump location. Water would then be pumped through hoses out of the work area and across the ford. Common methods and materials that could be used to block flows include an earthen or gravel berm or a water-filled rubber coffer dam. If flows are not present, the contractor could proceed with repairs to the upstream side of the ford without installing berms or a coffer dam, but per ADOT specifications the contractor would need a contingency plan to respond to unexpected surface flows that could occur during construction.

Capture and Translocation of Topminnows

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). Capture and relocation of topminnows at the Mesquite Creek crossing would not be necessary because work here would be limited to pavement resurfacing; thus, there would be no need to dewater the creek.

All fish capture and translocation work and aquatic species monitoring would be directed by a qualified fish biologist, under contract to ADOT, holding a FWS Section 10 recovery permit for

the Gila topminnow. The fish biologist would develop a detailed topminnow salvage plan based on conditions in the creek before construction, the contractor's dewatering plan, and a fish salvage protocol issued by ADOT in May 2016. The fish biologist would then undertake or supervise the following activities:

- A field visit to identify potential relocation areas 1-2 weeks prior to construction.
- A survey to estimate populations of the topminnow present in the work area.
- If surface water is flowing, installation of a temporary fish barrier, e.g., blocknetting.
- Removal and relocation of as many topminnows as possible. Nonnative species would be humanely euthanized using MS-222 (tricaine methanesulfonate, a Federal Drug Administration-approved fish anesthetic used for the temporary immobilization or euthanizing of fish, amphibians, and other aquatic cold-blooded animals).
- Installation of a cofferdam or other water bypass system as needed once initial fish salvage activities are complete.
- Dewatering of the work area by the contractor, including the perennial pool just below the ford, using pumps and hoses to carry water away from the work area, while the fish biologist monitors the area and salvages fish as needed.

One or a combination of seining, baited minnow traps, electrofishing, or dip nets and hand removal would be used to remove fish from the work area. The fish biologist would collect native fish (and native frogs if they are present) and store them in separate containers of Tortilla Creek water, keeping water at temperatures at or below 37^{0}C to avoid stress to topminnow (Carveth et al. 2006). Battery powered aerators would be used in the containers to assure that water in the containers is properly oxygenated.

Salvaged fish would be triple-sorted to minimize the risk of relocating non-native fish that are predators of topminnows, e.g., mosquitofish (*Gambusia affinis*) and green sunfish (*Lepomis cyanellus*), both of which are known to occur in Tortilla Creek both upstream and downstream of the ford. The decision about where to release salvaged topminnows would depend on site conditions at the time topminnows are captured and relocated (e.g., presence of surface flows when relocation occurs). The preference is to release fish downstream of the work area to reduce the chance of retrapping fish that may return to the work area if surface flows occur during construction. Relocating fish in areas that are free of nonnative predatory fish would also be important, as would avoiding the release of nonnative fish fry or eggs along with topminnows. ADOT's fish salvage protocol includes the following provisions concerning release sites:

- Fish must be relocated downstream of a modified natural barrier located approximately 300 ft upstream of the ford (described under the section, *Description of the Action Area*).
- Fish must be relocated into perennial pools or stream sections.
- Nonnative predators of topminnows (mosquitofish, sunfish) must be removed from release sites.
- Release sites must provide escape cover for topminnows, e.g., underbank areas, rock crevices, aquatic vegetation and/or woody debris.
- Release sites must contain pH, conductivity, dissolved oxygen, and temperature levels within the range needed by topminnows.

- Captured native frogs must be released separately from topminnows following the same provisions.

Conservation Measures

- During dewatering of the work area at the Tortilla Creek ford crossing, water that would be pumped from behind the temporary barrier, and from the pool downstream of the culvert pipe, would be monitored for turbidity, and if turbidity exceeds downstream measurements by 10% or more, 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.
- During clearing of the culvert pipe at the ford, discharge of material into the stream or streambed below the ford would be minimized using turbidity socks or other controls.
- After the new culvert pipe is installed, the contractor would hand-place non-shrinking grout at the downstream pipe opening, between the old and new pipes, 24 hours prior to pumping grout into the culvert from the upstream side, to prevent grout discharge to the downstream channel.
- All concrete at the ford crossing would be poured in the dry or within confined waters not being discharged to surface water and methacrylate sealant would be applied to the upstream surface (cut-off wall) before being exposed to surface waters.
- Use of herbicides along SR 88 would comply with a Pesticide Use Proposal approved by the Tonto National Forest based on the terms of the Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest System Lands in Arizona (2004).

Action Area

The U.S. Fish and Wildlife Service (FWS) defines the action area as all areas to be affected directly or indirectly by the proposed action, and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment, focusing on, but not exclusive to, the SR 88 project limits, as described above.

STATUS OF THE SPECIES

The Gila topminnow (*Poeciliopsis occidentalis occidentalis*), a small fish in the minnow family (Poeciliidae), is one of two subspecies of Sonoran topminnow (*P. occidentalis*) that occurs in Arizona. This topminnow was listed as endangered in 1967 without critical habitat (32 FR 4001). The species was later revised to include two subspecies, *P. o. occidentalis* and *P. o. sonoriensis* (Minckley 1969, 1973). *P. o. occidentalis* is known as the Gila topminnow, and *P. o. sonoriensis* is known as the Yaqui topminnow. Both subspecies are listed as endangered under the Act.

The Gila topminnow is thought to have been the most common fish in the Gila River Basin in Arizona, and its range also extended into Mexico and New Mexico (Minckley 1973).

Historically, the subspecies was found in Yavapai, Gila, Pinal, Maricopa, Graham, Greenlee, Cochise, Pima, Santa Cruz and Yuma Counties, Arizona (Arizona Game and Fish Department [AGFD] 2001).

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 subspecies 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).

Gila topminnows are relatively short-lived, with a life span of approximately one 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. The subspecies also feeds on aquatic insect larvae (AGFD 2001).

The reasons for decline of this fish include past dewatering of rivers, springs and marshlands; impoundment, channelization, diversion, and regulation of stream flows; land management practices that promote erosion and arroyo formation; and the introduction of predacious and competing nonnative fishes (Miller 1961, Minckley 1985).

Gila topminnows are highly vulnerable to adverse effects of nonnative aquatic species (Johnson and Hubbs 1989). Predation and competition from nonnative fishes have been a major factor in their decline and continue to be a major threat to remaining populations (Meffe 1985, Meffe et al. 1983, Brooks 1986, Marsh and Minckley 1990, Stefferud and Stefferud 1994, Weedman and Young 1997, Minckley and Marsh 2009). The Gila River Basin and Colorado River Basin contained few native fish species that were predatory on or competitive with Gila topminnows (Carlson and Muth 1989). In the riverine backwater and side-channel habitats that formed the bulk of Gila topminnow natural habitat, predation and competition from other fishes were essentially absent. Thus, topminnows did not evolve mechanisms for protection against predation or competition and are predator- and competitor-naive. Due to the introduction of many predatory and competitive nonnative fish, frogs, crayfish, and other species, Gila topminnows could no longer survive in many of their former habitats.

Reductions in the distribution and abundance of the topminnow are attributed in large part to predation by one species of nonnative fish: the mosquitofish (Miller 1961, Schoenherr 1974 Minckley et al. 1977, Meffe et al. 1982, Meffe et al. 1983, Meffe 1984, 1985, Minckley et al. 1991, Minckley 1999, Voeltz and Bettaso 2003, Duncan 2013). The mosquitofish was introduced in the early 1900s. This species uses the same habitat as the Gila topminnow and is aggressive and predatory, preying on young topminnows and harassing 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 outlook for the Gila topminnow is mixed. A recovery program actively stocks Gila topminnow in Arizona and New Mexico to reestablish topminnows in "new" sites (Robinson 2010, 2011, 2012). However, natural sites continue to slowly decline. Today, the subspecies exists at about 35 localities (9 natural and 26 stocked). Populations in many of these localities are small and highly threatened.

ENVIRONMENTAL BASELINE

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

Description of the Action Area

The Apache Trail (also known as SR 88) links Apache Junction, a town at the edge of the Greater Phoenix area, with Tortilla Flat, a small community located just below the ford at Tortilla Creek and continues on to the Roosevelt Dam. The area has a characteristic bimodal rainfall pattern, i.e., rain falls predominantly during the winter and during summer monsoons (Marshall et al. 2000). The Superstition Wilderness Area borders SR 88 to the east and south along most of its length. A portion of the roadway within the action area skirts the southern edge of Canyon Lake, which is the smallest of four reservoirs along the Salt River. Tortilla Creek is a tributary of the Salt River and flows into Canyon Lake. Mesquite Creek is a tributary of Tortilla Creek. The confluence of Tortilla Creek and Mesquite Creek is approximately 3,000 ft above the ford on Tortilla Creek.

Tortilla Creek is intermittent above the SR 88 ford and nearly perennial below the ford. Surface flows at the crossing can decrease to less than one gallon per minute (0.01 cubic ft per second), and at times are nonexistent. A number of small permanent bedrock-constrained pools occur both upstream and downstream of the ford. These pools appear to be deep enough to be sustained by subsurface flows because they persist when flows are not present (K. Kessler, TNF, personal communication to Kris Gade, ADOT, 2014). One permanent pool at the downstream end of the existing culvert pipe at the ford effectively blocks access to the downstream side of the ford. 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 an ADOT site visit on August 26, 2014.

A barrier to fish movement on Tortilla Creek occurs approximately 300 ft above the Tortilla Creek ford crossing. The barrier is a modified natural feature of the landscape, formed by a shelf of bedrock and a rockwall at one end put in place by humans sometime in the past. Mosquitofish are present below this barrier, and green sunfish and sunfish fry and eggs may also be present (R.

Timmons, AGFD fish biologist, personal communication to R. Lehman, FWS, April 1, 2016). Predatory fish species are not known to be present upstream of the modified natural barrier.

Status of the Species Within the Action Area

In 1982, 1,000 Gila topminnows from Boyce Thompson Arboretum were stocked into Mesquite Tank #2, a small dirt impoundment with a concrete dam located in an unnamed drainage (Site #68B; see Figure 2) nearly 1 mi upstream of the SR 88 Tortilla Creek crossing (Voeltz and Bettaso 2003). After topminnows were stocked, a drain valve at the bottom of the concrete dam was opened without authorization, the tank drained, and the stocked topminnows dispersed downstream. Since then, topminnows have been documented regularly in that unnamed drainage, in Mesquite Creek, and in Tortilla Creek downstream to about 0.25 mi below the ford (Voeltz and Bettaso 2003). Voeltz (2005) surveyed topminnows in the action area in June and November 2005. In June, topminnows were present "upstream of Tortilla Flat" (no further details were provided), and in November topminnows were found "thriving" in several pools just above Tortilla Flat and in a pool in the unnamed drainage. Surveys conducted by AGFD at two locations in April 2013 documented Gila topminnows in the unnamed drainage and in Mesquite Creek just upstream of its confluence with Tortilla Creek (K. Kessler, TNF, personal communication to Kris Gade, 2014).

The most recent information about topminnow distribution and numbers within the action area resulted from surveys conducted by AGFD, ADOT, and FWS biologists in the Tortilla Creek and Mesquite Creek drainages on March 31, 2015. Survey methods included 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, upstream of its confluence with Mesquite Creek, and Tortilla Creek from its confluence with Mesquite Creek downstream to just below the ford (Figure 2).

The persistence of the Gila topminnow within the project limits 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. Population estimates for the topminnow within the action area, given below, are based on the March 2015 surveys. R. Timmons (AGFD, personal communication to R. Lehman, FWS, April 1, 2016) estimated that 1,000-2,000 topminnows currently occur from about 0.25 mi downstream of the Tortilla Creek ford, upstream to Site #68B, and to the confluence, and just upstream of the confluence, of Tortilla Creek and Mesquite Creek. Jessica Gwinn (FWS, personal communication to R. Lehman, April 5, 2016), estimated that 2,000-3,000 topminnows presently occur within this area.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the subspecies or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the

action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Gila topminnow surveys conducted on March 31, 2015 and in the years prior to that date indicate there is a high degree of certainty that Gila topminnows would be present within the action area when dewatering of Tortilla Creek at the ford and construction along SR 88 begins. Direct effects of the project would involve 1) disturbances to the topminnow associated with dewatering, capture, and relocation of fish prior to reconstruction of the ford crossing; and 2) physical effects to the streambed at the crossing and to aquatic vegetation in pools at and near the crossing as a result of access road construction and use of heavy equipment at the ford. Indirect effects of the project could involve effects to water quality as a result of sediments and contaminants entering the water way during construction.

Dewatering of Tortilla Creek, Topminnow Removal and Translocation

Dewatering and construction activities would preclude upstream or downstream movement of topminnows into or past the work area for six weeks. The effects of limiting topminnow movements during this period are unknown; however, preventing upstream movement of predatory fish from below the ford in the event that surface flows occur during construction would be a temporary beneficial effect of the project.

Dewatering and ford reconstruction activities would occur during the months of April–June and would overlap the topminnow reproductive period. As a result, there may be direct impacts to young fish as well as adults. For this reason, pumps used for dewatering would be fitted with fish screens with mesh screens 0.125 inches or smaller to minimize impacts to young fish associated with dewatering.

During dewatering at the Tortilla Creek ford, efforts would be made to relocate all fish from within the work area. However, topminnow removal activities may not be 100 percent effective because these small fish may hide in underbank areas and in aquatic vegetation and be missed during removal. Fish that cannot be removed prior to dewatering are likely to be killed as a result of dewatering.

There is also the potential for fish to be stressed, injured, or to die while they are being held during capture operations and during and after release operations. However, protocols outlined above, in the *Description of the Proposed Action* section would minimize injuries or fatalities of topminnows resulting from the proposed action.

Streambed and Vegetation Effects

Access to the upstream ford work area would require grading and construction of an access road within the stream channel. Access to the downstream side of the ford would require draining of the bedrock constrained pool just below the downstream culvert opening. In both cases, vegetation in the channel and in the pool, including Goodding's willow, buttonbush and giant reed, would need to be removed or would die as a result of dewatering. These activities would eliminate escape cover for the topminnow after water barriers are removed at the end of the

project. However, aquatic vegetation in the channel and pool would regenerate quickly; thus, effects of vegetation removal would be temporary. In addition, the stream bed would be recontoured after construction to match its original condition.

Effects on Water Quality

Materials that would be used during reconstruction of the ford crossing on Tortilla Creek, and during roadway sealing from MP 213.35 to MP 220.20, could adversely affect water quality and harm or kill fish or other aquatic organisms that are present if releases of contaminants occur during construction activities. Potential contaminants include cast-in-place concrete, concrete curing agents, non-shrinking grout, methacrylate concrete sealer, bituminous material (asphalt emulsions), and vehicle lubricants. Under optimal (i.e., dry) conditions, any impacts to water quality are likely to be minimal or nonexistent. An unforeseen large storm event that results in surface flows through the action area during construction, or an accidental spill of a contaminant material, could seriously affect water quality, but we consider these to be unlikely events.

CUMULATIVE EFFECTS

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

Lands in the action area are primarily undeveloped public lands used for outdoor recreation, e.g., boating, hiking, camping, rock-climbing, fishing, and hunting. Boating and fishing occurs primarily at Canyon Lake, located approximately 2 miles below the ford crossing at Tortilla Creek. Boating and fishing on Canyon Lake and other outdoor activities as described above are unlikely to have any effect on topminnows.

CONCLUSION

After reviewing the current status of the Gila topminnow, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the Gila topminnow. No critical habitat has been designated for this species, therefore none will be affected. We base this conclusion on the following reasons:

- Although fatality or injury of topminnows is likely to occur during capture and translocation of topminnows prior to and during dewatering activities at the ford crossing on Tortilla Creek, implementation of the fish salvage protocol should minimize loss of these fish and ensure their survival in Tortilla Creek post-construction.
- Effects to Gila topminnow habitat will be temporary and habitat characteristics should return to pre-project conditions within a short time frame after construction is completed.

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

INCIDENTAL TAKE STATEMENT

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

AMOUNT AND EXTENT OF TAKE

We anticipate that the proposed action is reasonably certain to result in incidental take of Gila topminnows. This incidental take is expected to be in the forms of harm (direct fatality) and harassment resulting from the effects of the proposed action on the topminnow. The proposed capture and relocation of Gila topminnow will harass all individuals captured and may result in harm (injury and/or fatality) of a portion of those fish, either during capture, during temporary holding, or after release. Fish that die after release, due to the stress from handling or predation of weakened individuals, are unlikely to be detected, and therefore we cannot quantify that amount of take due to the proposed action that will occur after fish are relocated. We anticipate take in the form of injury or death of no more than ten percent of the number of Gila topminnows that are trapped at the ford crossing of Tortilla Creek, held temporarily, and released.

Additionally, we cannot quantify the number of individual topminnows that escape capture and are subsequently taken due to dewatering because most dead or impaired individuals that are not captured during the salvage/translocation process will be almost impossible to find and will likely be consumed by predators. We anticipate take in the form of injury or death of all Gila topminnows that are not captured (i.e., that are missed) at the ford crossing of Tortilla Creek.

The level of incidental take is expected to be low given that mitigation efforts described above under *Description of the Proposed Action* and under *Conservation Measures* will be followed explicitly by the construction contractor and by the fish biologist who implements the topminnow salvage protocol. The substantial efforts that ADOT has committed to by ensuring that a qualified fish biologist will monitor the operations described in this BO should reduce take

to its lowest possible level. BMPs described under *Reconstruction of the Tortilla Creek Ford Crossing* will reduce and perhaps eliminate negative changes to water quality resulting from the proposed action. We will consider take to be exceeded if construction activities outside of the dewatered reach result in additional Gila topminnow fatalities or if the fish relocation protocol is not followed and results in additional unanticipated fatalities.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that the above level of take is not likely to result in jeopardy to the Gila topminnow. While the proposed action may adversely affect the Gila topminnow in the short-term through harassment and the loss of some individual fish that cannot be captured and relocated, the proposed action will not result in the permanent loss of Gila topminnow in the action area.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The following reasonable and prudent measure is necessary and appropriate to minimize take of the Gila topminnow:

1. The FHWA/ADOT shall monitor incidental take resulting from the proposed action and report to the FWS the findings of that monitoring.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA/ADOT must comply with the following term and condition, which implements the reasonable and prudent measure described above and outlines reporting/monitoring requirements. This term and condition is non-discretionary.

1. FHWA/ADOT shall notify the FWS Arizona Ecological Services Office 1-2 weeks before topminnow salvage activities begin. A Fish Salvage Report shall be submitted within 2 weeks of the completion of each salvage effort, and a Project Completion Report shall be submitted within 60 days of completion of all work at the Tortilla Creek crossing.

    a. The Project Completion Report shall include:

        - Actual amounts of disturbance (e.g., acres of streambed and streamside habitat) degraded and restored.
        - Confirmation of storm water management that was implemented including photographs.
        - Descriptions of work area isolation measures implemented.
        - Total numbers of listed species salvaged, injured, and killed.

Disposition of Dead or Injured Listed Species

Upon locating a dead or injured listed species, initial notification must be made to the FWS's Law Enforcement Office, 4901 Paseo del Norte NE, Suite D, Albuquerque, NM 87113 (505-248-7889) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

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

Gila Topminnow

- We recommend that FHWA and ADOT work with us and AGFD to participate in recovery planning and implementation of conservation actions for the Gila topminnow, particularly on efforts to remove harmful nonnative species from occupied topminnow habitats.

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

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request, and no further section 7 consultation is required for this project at this time. As provided in 50 CFR '402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the taking,

killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from http://www.fws.gov/migratorybirds and http://www.fws.gov/migratorybirds/mbpermits.html. For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007 (http://www.fws.gov/southwest/es/arizona/BaldEagle.htm), as well at the Conservation Assessment and Strategy for the Bald Eagle in Arizona (SWBEMC.org).

The FWS appreciates efforts by the FHWA and ADOT to identify and minimize effects to listed species from this project. We encourage you to coordinate the review of this project with AGFD. We also appreciate your ongoing coordination during implementation of this program. In keeping with our trust responsibilities to American Indian Tribes, we are providing copies of this biological and conference opinion to the Bureau of Indian Affairs and are notifying affected Tribes.

For further information please contact Robert Lehman (602) 242-0210 (x217) or Brenda Smith at (928) 556-2157. In all future correspondence on this project, please refer to consultation number 02EAAZ00-2014-F-0555.

Sincerely,

Brenda H. Smith

for Steven L. Spangle
Field Supervisor

cc (electronic)

Fish and Wildlife Biologist, Fish and Wildlife Service, Phoenix (Attn: Kathy Robertson)
Fish and Wildlife Biologist, Fish and Wildlife Service, Tucson (Attn: Doug Duncan)
Supervisor, Region 6, Arizona Game and Fish Department, Mesa, AZ (Attn: Jay Cook)
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (Attn: Joyce Francis)
Arizona Department of Transportation, Phoenix, AZ (Attn: Kris Gade, Josh Fife, Justin White, Audrey Navarro)
Environmental Coordinator, Federal Highway Administration, Phoenix, AZ (Attn: Rebecca Yedlin)

Karla S. Petty

Chairman, Salt River Pima-Maricopa Indian Community, Scottsdale, AZ
Chairman, Fort McDowell Yavapai Nation, Fountain Hills, AZ
Environmental Specialist, Environmental Services, Western Regional Office, Bureau of Indian Affairs, Phoenix, AZ

\\10.102.37.14\WorkFiles\Bob Lehman\Brendas signature\SR 88 Apache Trail BO.docx:cgg

LITERATURE CITED

Arizona Game and Fish Department (AGFD). 2001. *Poeciliopsis occidentalis occidentalis*. Unpublished abstract compiled and edited by the AGFD Heritage Data Management System, Phoenix.

Brooks, J.E. 1986. Status of natural and introduced Sonoran topminnow (*Poeciliopsis o. occidentalis*) populations in Arizona through 1985. U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Carlson, C.A., and R. Muth. 1989. The Colorado River: Lifeline of the American southwest. Pages 220-239 *in* D.P. Dodge, editor, Procceedings of the International Large River Symposium. Canadian Special Publication of Fisheries and Aquatic Sciences 106.

Carveth, C.J., A.M. Widmer, and S.A. Bonar. 2006. Comparison of upper thermal tolerances of native and nonnative fish species in Arizona. Transactions of the American Fisheries Society 135:1433-1440.

Duncan, D.K. 2013. Gila topminnow interactions with western mosquitofish: an update. Pages 283-287 *in* G.J. Gottfried, P.F. Ffolliott, B.S. Gebow, L.G. Eskew, and L.C. Collins, compilers, Merging Science and Management in a Rapidly Changing World: Biodiversity and Management of the Madrean Archipelago III, and 7th Conference on Research and Resource Management in the Southwestern Deserts, May 1-5, 2012, Tucson, Arizona. Proceedings, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, RMRS-P-67, Fort Collins, Colorado.

Johnson, J.E., and C. Hubbs. 1989. Status and conservation of poeciliid fishes. Pages 301-331 *in* G.K. Meffe, and F.F. Snelson, editors, Ecology and Evolution of Livebearing Fishes (Poeciliidae). Prentice Hall, Englewood Cliffs, New Jersey.

Law, D.W. and S. Setunge. 2014. The impact of curing compounds on the leaching from concrete. Pages 403–407 *in* M. Grantham, P.A.M. Basheer, and B. Magee, editors, Concrete Solutions, Taylor and Francis Group, London.

Marsh, P.C., and W.L. Minckley. 1990. Management of endangered Sonoran topminnow at Bylas Springs, Arizona: description, critique, and recommendations. Great Basin Naturalist 50:265-272.

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, and 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.

Meffe, G.K. 1984. Effects of abiotic disturbance on coexistence of predator-prey fish species. Ecology 65:1525-1534.

Meffe, G.K. 1985. Predation and species replacement in American Southwestern stream fishes: A case study. Southwestern Naturalist 30:173-187.

Meffe, G.K., D.A. Hendrickson, and J.N. Rinne. 1982. Description of a new topminnow population in Arizona, with observations on topminnow/mosquitofish co-occurrence. Southwestern Naturalist 27:226-228.

Meffe, G.K., D.A., Hendrickson, W.L. Minckley, and J.N. Rinne. 1983. Factors resulting in decline of the endangered Sonoran topminnow *Poeciliopsis occidentalis* (Atheriniformes: Poeciliidae) in the United States. Biological Conservation 25:135-159.

Miller, R.R. 1961. Man and the changing fish fauna of the American Southwest. Papers of the Michigan Academy of Science, Arts, and Letters 46:365-404.

Minckley, W.L. 1969. Native Arizona fishes, part I— livebearers. Arizona Wildlife Views 16:6-8.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Phoenix.

Minckley, W.L. 1985. Native fishes and natural aquatic habitats in U.S. Fish and Wildlife Region II west of the Continental Divide. Report to U.S. Fish and Wildlife Service, Albuquerque, New Mexico. Department of Zoology, Arizona State University, Tempe.

Minckley, W.L, and P.C. Marsh. 2009. Inland fishes of the greater southwest: chronicle of a vanishing biota. University of Arizona Press, Tucson.

Minckley, W.L., J.N. Rinne, and J.E. Johnson. 1977. Status of the Gila topminnow and its co-occurrence with mosquitofish. U.S. Department of Agriculture, Forest Service, Research Paper RM-198:1-8.

Minckley, W.L., D.A. Meffe, and D.L. Soltz. 1991. Conservation and management of short-lived fishes: the cyprinodontoids. Pages 247-282 *in* W.L. Minckley and J.E. Deacon, editors, Battle Against Extinction-Native Fish Management in the American West. University of Arizona Press, Tucson.

Robinson, A. 2011. Gila River Basin native fishes conservation program: cooperative Agreement 201819J853 semi-annual report for the period May 1, 2010--October 31, 2010. Arizona Game and Fish Department, Phoenix.

Robinson, A. 2012. Gila River Basin native fishes conservation program: cooperative Agreement 201819J853 semi-annual report for the period May 1, 2011--October 31, 2011. Arizona Game and Fish Department, Phoenix.

Robinson, A. 2013. Gila River Basin native fishes conservation program: cooperative Agreement F09AC00084, annual report for the period Nov. 1, 2011 thru October 31, 2012. Arizona Game and Fish Department, Phoenix.

Schoenherr, A.A. 1974. Life history of the topminnow, *Poeciliopsis occidentalis* (Baird and Girard) in Arizona, and an analysis of its interaction with the mosquitofish *Gambusia affinis* (Baird and Girard). Ph.D. Dissertation, Arizona State University, Tempe.

Stefferud, J.A., and S.E. Stefferud. 1994. Status of Gila topminnow and results of monitoring of the fish community in Redrock Canyon, Coronado National Forest, Santa Cruz County, Arizona, 1979-1993. Pages 361-369 *in* L.F. DeBano, P.F. Ffolliott, A. Ortega-Rubio, G.J. Gottfried, R. H. Hamre, and C. B. Edminster, technical coordinators, Biodiversity and Management of the Madrean Archipelago: The Sky Islands of Southwestern United States and Mexico. U.S. Department of Agriculture, Forest Service, General Technical Report RM-GTR-264, Rocky Mountain Forest & Range Experiment Station, Fort Collins, Colorado.

U.S. Forest Service, Region 3. 2004. Environmental assessment for management of noxious weeds and hazardous vegetation on public roads on National Forest System Lands in Arizona.

Voeltz, J.B. 2005. Gila topminnow monitoring at unnamed drainage #68B and Tortilla Creek. Arizona Game and Fish Department, unpublished report dated November 4, 2005, Phoenix.

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. 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.

White, J.A. 2007. Recommended protection measures for pesticide applications in Region 2 of the U.S. Fish and Wildlife Service. U.S. Fish and Wildlife Service, Region 2, Environmental Contaminants Program, Austin, Texas.

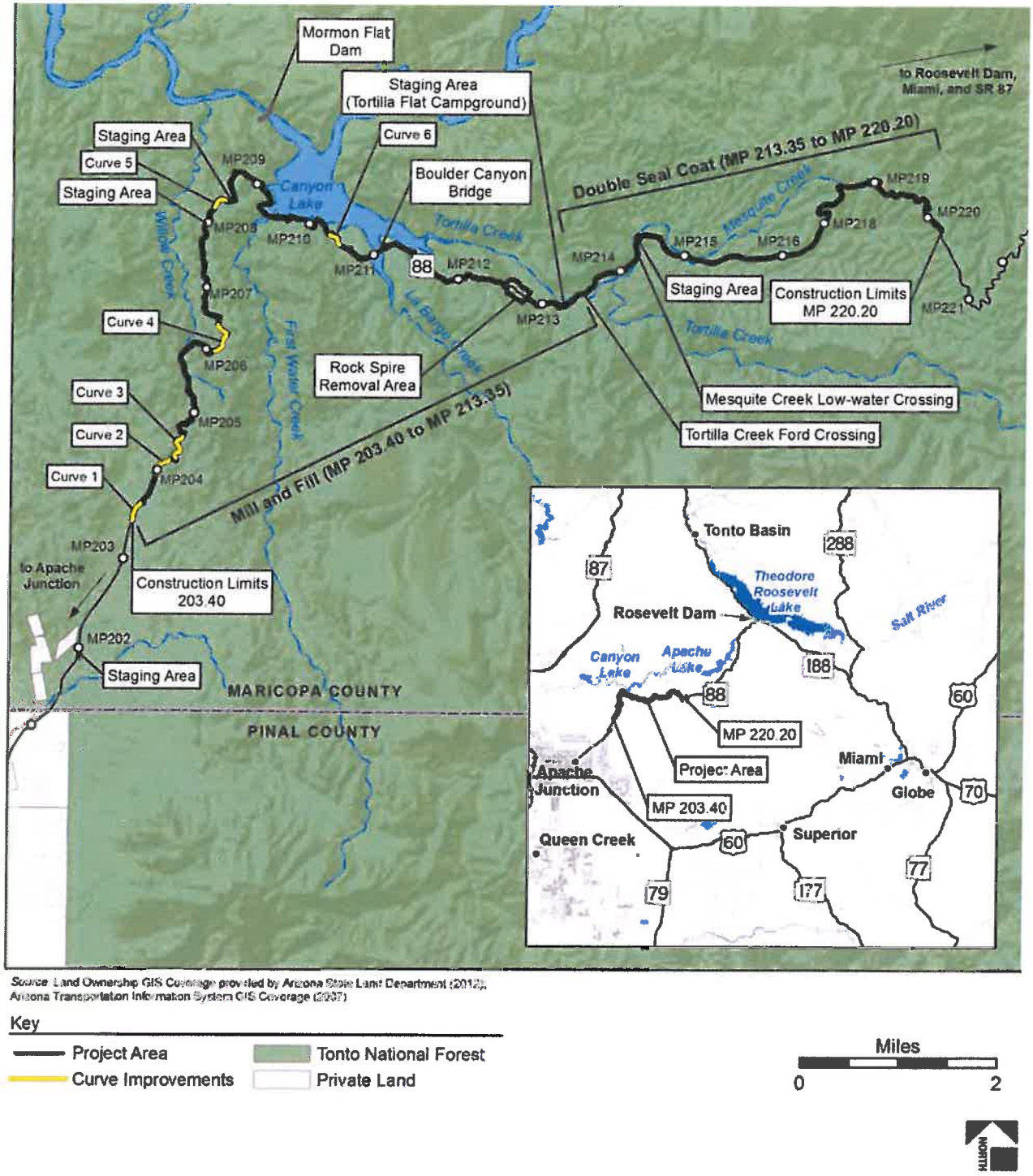

Figure 1. The action area

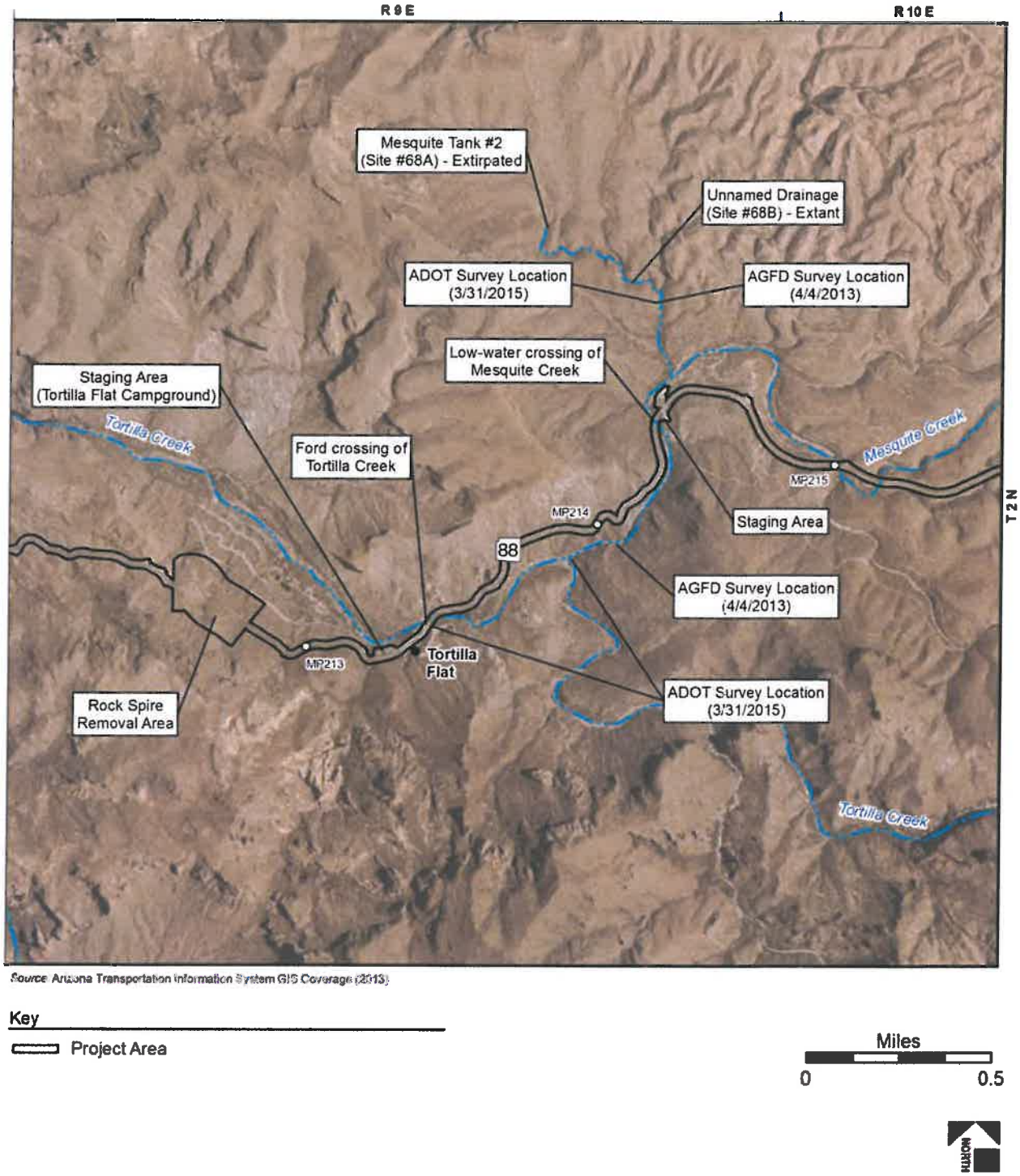

Figure 2. Gila topminnow reintroduction and survey locations