# United States Department of the Interior
**Fish and Wildlife Service**
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**In reply refer to:**
AESO/SE
02EAAZ00-2016-F-0244
02EAAZ00-2017-CPA-0060

February 14, 2018

Joshua Fife, Biology Team Lead
Arizona Department of Transportation
Environmental Planning Group
1611 W. Jackson St.
Phoenix, Arizona 85007

RE: I-17 Verde River Bridge Scour Retrofit Project
FHWA File # FA-017-B(224)T
ADOT File # 017-YV-287-H8544-01C

Dear Mr. Fife:

Thank you for your request for formal and informal consultation and informal conference 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). At issue are effects of a bridge scour retrofit project at two bridges on Interstate 17 (I-17), over the Verde River, in Yavapai County, Arizona (Figure 1), proposed by the Federal Highway Administration (FHWA) and Arizona Department of Transportation (ADOT). We received your consultation request via electronic mail (email) on July 7, 2017. We also received the biological evaluation (BE) for the proposed action, dated June 19, 2017, on July 7, 2017.

In your consultation request, you concluded that the proposed action "may affect, and is likely to adversely affect" designated critical habitat for the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher), and proposed critical habitat for the western yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo). You also concluded that the proposed action "may affect, and is likely to adversely affect" the threatened northern Mexican gartersnake (*Thamnophis eques megalops*) and its proposed critical habitat, and proposed critical habitat for the threatened narrow-headed gartersnake (*Thamnophis rufipunctatus*). In addition, you concluded that the proposed action "may affect, and is likely to adversely affect" the endangered razorback sucker (*Xyrauchen texanus*) (sucker or razorback) and its designated critical habitat, and the endangered spikedace (*Meda fulgida*) and its designated critical habitat. Finally, you concluded that the proposed action "may affect, but is not likely to adversely affect" the flycatcher and cuckoo.

On October 17, 2017, based on data we provided on the narrow-headed gartersnake, you sent by email an updated consultation request that was dated October 13, 2017, asking for our concurrence that the proposed action "may affect, but is not likely to adversely affect" the narrow-headed gartersnake (your determination previously had been that the project would have "no effect" on this gartersnake). On October 17, 2017, you also sent a revised BE with an updated analysis of effects on the narrow-headed gartersnake.

Below we provide a biological opinion (BO) on effects of the proposed action on the northern Mexican gartersnake, sucker, spikedace, and designated critical habitat for the sucker, spikedace and flycatcher. We also provide a conference opinion (CO) on effects to proposed critical habitat for both gartersnakes and the cuckoo. Finally, we concur with your conclusions that the proposed action "may affect, but is not likely to adversely affect" the flycatcher, cuckoo, and narrow-headed gartersnake and provide our rationales in Appendix A.

Your consultation request dated July 7, 2017, also concluded that the proposed project "may affect, and is likely to adversely affect" the proposed threatened roundtail chub (*Gila robusta*). However, our proposal to list the roundtail chub as a threatened species was withdrawn on April 7, 2017 (82 FR 16981). Thus, consultation on this species is no longer required and will not be addressed further in this BO/CO.

This BO/CO is based on information provided in the BE that we received on July 7, 2017, and on information provided in email correspondence, telephone conversations, field investigations, and the revised BE and updated analysis for the narrow-headed gartersnake we received on October 17, 2017. The BO/CO also incorporates the northern Mexican gartersnake and native fish monitoring and relocation protocols you provided, as described below. Literature cited herein is not a complete bibliography of all literature available on the species of concern, bridge retrofit projects and their effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office (file number 02EAAZ00-2016-F-0244).

**Consultation History**

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| March 26, 2015 | We signed a concurrence for a bridge deck rehabilitation and expansion joint replacement on the I-17 Verde River bridges (2014-I-0190). |
| July 7, 2017 | We received your request for formal and informal consultation and conference on the current proposed action, a bridge scour retrofit, along with the BE for the project, dated June 19, 2017. |
| July 24, 2017 | We sent a 30-day letter indicating that all information required to initiate consultation was either included with your consultation request, was in the BE, or was otherwise accessible for our consideration and reference. |
| September 22, 2017 | We received ADOT's draft fish salvage protocol for our review. |
| September 25, 2017 | We received ADOT's draft northern Mexican gartersnake monitoring and relocation protocol for our review. |

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| September 28, 2017 | We sent ADOT comments on the draft gartersnake and fish salvage protocols. |
| October 13, 2017 | We received your updated BE and consultation request for our concurrence on the narrow-headed gartersnake, and your analysis of effects on that gartersnake. |
| January 16, 2018 | We received the final draft of the northern Mexican gartersnake monitoring and relocation protocol, dated January 12, 2018, and the final draft of the fish salvage protocol, dated January 16, 2018. |
| February 9, 2018 | We sent you our draft BO/CO. |

## BIOLOGICAL AND CONFERENCE OPINION

### DESCRIPTION OF THE PROPOSED ACTION

The following summary of the proposed action is taken from the original and revised BEs. Maps, photographs, and diagrams related to the action are included in the BEs and are incorporated herein by reference. We also include two figures from the BEs that we have attached after Appendix A: Figure 1, entitled *Vicinity map for the I-17 Verde River Bridge Project, also showing the Salt River Project's Camp Verde Riparian Preserve*; and Figure 2, entitled *Access routes, staging area, temporary work bridge, dewatering channels, and pier locations for the I-17 Verde River Bridge Project*.

ADOT in association with FHWA is planning a bridge scour retrofit project at the Verde River bridges on I-17 approximately one mile (mi) north of the I-17/State Route (SR) 260 traffic interchange in the Town of Camp Verde. At the approaches to the bridges, I-17 has two 12.5-foot (ft)-wide travel lanes in both directions (northbound and southbound) and 4-ft-wide paved inside and outside shoulders separated by a 50-ft median. The southbound bridge is a seven-span, steel girder bridge constructed in 1961. This bridge is 525 ft long. The seven-span, steel girder northbound bridge was constructed in 1979. It is 524 ft long. Both bridges are supported by six piers (a total of 12 will be retrofitted). According to inspections performed by ADOT, the piers currently show deterioration due to scouring, with cracks on the abutments, pier walls, and pedestals. Footings of piers are exposed in some cases. Inspection of the bridges indicates that the piers need to be stabilized to preserve structural integrity. The purpose of the project is to protect the bridges from further erosion by the Verde River.

The project scope would consist of:

- Conducting limited geotechnical investigations (percolation tests of soils) at no more than two sites;
- Improving and widening existing access roads and installing a temporary access lane via southbound I-17 to provide direct access to the bridges;
- Creating temporary dry work zones within the river bottom through construction of diversion channels;
- Constructing concrete armor protection around each pier for long-term stabilization;

- Staging and stockpiling materials outside the low-flow river channel;
- Restoring the river and floodplain to pre-construction conditions following construction;
- Reseeding/replanting areas disturbed by construction.

**Definitions**

In this BO/CO, the term "construction footprint" is used to represent areas at and adjacent to the bridges where vegetation removal and other surface disturbances would occur. The construction footprint includes approximately 6.2 acres (ac) of the Verde River and its floodplain that would be affected as a result of access route development, development of the staging and stockpiling area, the geotechnical investigation, channelizing the river, and pier retrofits, as detailed below.

The term "project area" is used to represent lands outside but directly adjacent to the construction footprint. The project area encompasses approximately 89 ac that include 1.3 mi of the I-17 roadway—from milepost (MP) 287.7 to MP 289.0—and areas contained in ADOT easements and covenants. Within the project area, I-17 is centered on a 300-ft-wide ADOT right-of-way (ROW). At the Verde River bridges, ADOT holds easements and covenants up to 1,000 ft west and east of I-17. Within these easements and covenants, lands are owned or administered by the Salt River Project (SRP, a public utility), the Town of Camp Verde, and private individuals. Lands within the project area are undeveloped, residential, or agricultural.

In the BE, the term "project vicinity" is used to denote landscapes extending beyond the construction footprint and project area. In this BO/CO, we do not use the term "project vicinity." Instead, we use the FWS's standard term "action area" in a similar context, as defined on page 7 of this BO/CO.

**Project Timeline and Vegetation Removal**

The BE indicates that the geotechnical investigation would occur between May and August 2018 and would take about one day to complete. All other project activities are projected to begin after September 30, 2018. Under the proposed schedule, all construction activities would be completed six months later, by late March 2019. Project start-up activities and site preparations—access road development, development of staging and stockpiling areas, and movement of heavy equipment and materials into the construction site—would occur during October 2018.

Vegetation removal would be confined to the 6.2-ac construction footprint and would be minimized to the extent possible wherever it occurs. All vegetation removal would occur from October 1, 2018 to February 28, 2019. Large trees (greater than 12 inches in diameter-at-breast-height) would not be removed from the construction footprint and dense stands of shrubs and trees would be avoided if possible.

**Geotechnical Investigation**

The geotechnical investigation would consist of digging a test pit (possibly two pits), 10 ft deep by 10 to 20 ft in diameter, on the west side of the southbound bridge within the existing cobble substrate. Water in each pit would be removed by a small gasoline powered pump and the rate of water return would be measured. Each pit would then be filled in. Filters would be used to

remove sediment from water that is fed into the river, or water from each pit would be fed into a settling basin.

**Access to the Bridges**

The bridges would be accessed from existing paved roads that pass through residential areas along both sides of I-17 that connect to dirt roads ending at the bridges (Figures 1 and 2). Roundup Road on the east side of the highway and North Rawhide Road on the west side would provide access. Unpaved portions of these access points would need to be widened and graded to accommodate heavy equipment. Direct access would also be provided by constructing a new, temporary access lane from southbound I-17. Access road improvements would occur mostly in areas with little existing vegetation. About 0.6 ac of ground disturbances would occur during access road improvements.

**Staging and Stockpiling**

Equipment staging and stockpiling of fill material for berms and for use in restoration of the construction footprint would occur west of the southbound bridge in areas of cobble and dirt with sparse vegetation lying outside the low-flow channel (Figure 2). Staging and stockpiling would occur within a 0.7-ac area.

**Water Diversions and Dewatering**

Construction activities at the bridges would require dry work areas at 12 piers. To accomplish this, two earthen-berm bypass channels (Figure 2) would be constructed in two phases to divert the river. The Phase 1 channel would extend downstream from the bridges and would be approximately 60 ft wide with a 20-ft berm on each side consisting of excavated soil. Width of this channel would be 100 ft and length would be approximately 900 ft, with a total disturbance of approximately 2.1 ac. The second channel would begin upstream (west) of the bridges and end at the bridges. This channel would have a similar width and would be almost 640 ft long (1.4 ac). Depending on circumstances at the time of construction, it is possible that the sequence of water diversions, as described above, would be reversed. Approximately 3.5 ac of vegetation removal and ground disturbance would occur for the Phase 1 and 2 bypass channels.

Channel construction would require the use of heavy equipment on the floodplain to clear vegetation, dig trenches, create earthen berms, and stockpile soil and cobble for site restoration after the project is completed. The river would not be directed into the diversion channels until the channels are fully constructed. Until then, temporary earthen berms would block water in the river from the channels. Prior to channelization, the contractor would be required to develop a water management plan that would detail methods for dewatering and for maintaining dewatered areas during construction. The water management plan would include procedures for dealing with unexpected flooding of the work area during construction. Regardless of the sequence that channels are built, the original Verde River channel would be restored after project completion.

**Temporary Bridge**

A temporary bridge (Figure 2) would be constructed across the Phase 2 bypass channel to allow equipment access to both sides of the river. It would be a modular, portable, truss bridge built on site from pre-fabricated, ready-to-assemble components. Small temporary concrete abutments or

timber sill type abutments would be used to anchor the bridge. This type of bridge is designed for quick and easy assembly and disassembly, and the bridge could be hoisted into place and moved by a small crane. This would assure that the bridge could be moved if flooding of the Verde River occurs during construction.

**Snake and Native Fish Capture and Relocation**

A northern Mexican gartersnake monitoring and relocation protocol has been developed for this project (ADOT 2018a). This protocol provides for biological monitors to conduct visual encounter surveys within the construction footprint prior to and during construction to capture and relocate gartersnakes before they are harmed. Biological monitors would be under the direction of a qualified biologist holding a FWS section 10 recovery permit. Methods of capture would include hand capture and capture using hand nets. Captured snakes would be released 50 to 100 meters upstream or downstream of the construction footprint and would be placed at the entrance to a cavity under downed wood, at a rock pile, or near a burrow. The intent would be to release snakes within their presumed home ranges as documented by Emmons and Nowak (2016). The snake relocation protocol, and conservation measures outlined below, specify procedures for conducting surveys and for processing, transporting, and releasing snakes.

A fish salvage and relocation protocol has also been developed for this project (ADOT 2018b). This protocol and conservation measures outlined below provide for razorback suckers and spikedace to be removed and relocated downstream of areas to be affected by channelizing the river and dewatering of the construction footprint. Other native fish and amphibians would also be relocated. Nonnative fish, crayfish, and frogs would be humanely euthanized. Fish salvage procedures would be finalized after the water management plan (mentioned above) has been developed. All fish capture and relocation work would be directed by a qualified fish biologist holding a FWS section 10 recovery permit for the razorback and spikedace. Generally, procedures for fish salvage and relocation would include 1) installation of fish exclusion materials such as barrier nets around areas to be channeled; 2) removal of as many fish as possible before channelizing and dewatering using block nets, baited minnow traps, electrofishing, or dip nets and hand removal; and 3) salvage of fish that were not captured before dewatering by fitting pumps used to remover water from blocked areas with fish screens of an appropriate mesh size, as specified in the protocol and conservation measures.

Northern Mexican gartersnakes, razorback suckers, spikedace, and other native species found dead or injured during the project would be processed per provisions under the *Disposition of Dead or Injured Listed Species* section on page 35 of this BO/CO.

**Scour Protection**

Scour protection would involve construction of concrete armor around each pier to prevent erosion. Armor would extend approximately 2.5 feet below the bottom of the existing pier pile cap (cement pad over the piles upon which the pier sits) and extend 10 ft upstream and 10 ft downstream of the bridge, with buried cutoff walls of 4.5 feet in height around the piers. Work below and around the piers would involve surface disturbances of about 1.4 ac.

**Summary**

In summary, this project will involve vegetation removal and surface disturbances within 6.2 ac (the construction footprint): 0.6 ac for access road improvements; 0.7 ac for the staging area; 3.5 ac for two channels to divert the river during construction; and 1.4 ac for work around the piers. All of these areas will be restored after construction as discussed below.

Action Area

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 FR § 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 I-17 crossing of the Verde River. For our purposes, the action area is larger than the construction footprint and project area combined. This allows us to address issues related to water management (e.g., diversions and groundwater pumping) upstream of the Verde River bridges, and sedimentation issues downstream of the bridges that would result from construction activities. However, we do not define the action area in terms of a specific number of miles upstream or downstream of the bridge site.

Conservation Measures

Conservation measures are those outlined on pages 37-40 of the revised BE as "Conservation Commitments." The commitments are presented in the BE under subheadings that include design, district, and contractor responsibilities. The BE also includes species-specific measures for each species under separate headings. We have sorted the conservation measures and commitments into general measures, environmental awareness training, and species-specific measures:

**General Measures**

- In addition to the water management plan mentioned above, a storm water pollution prevention plan, spill prevention and pollution plan, and sediment containment plan would be prepared and implemented prior to and during construction to prevent adverse effects of the planned action on soils and water quality.
- These plans incorporate best management practices (BMPs) to accomplish the stated goals (minimizing effects to soils and water quality).
- The stormwater pollution prevention plan would prescribe responses to flood events that may occur during construction. Responses would include removal of the temporary bridge, heavy equipment removal, and removal of construction materials from the floodplain if a flood occurs.
- The spill prevention and pollution plan would include measures to assure that toxic materials (green concrete, fuels, oil) do not enter the river directly or indirectly during construction. For example, refueling and vehicle or equipment repair would occur outside the 100-year floodplain, or would take place within an area containing secondary containment protection. A secondary containment system would be placed around

gasoline powered pumps used during the geotechnical investigation and during dewatering.
- The sediment containment plan would minimize discharge of sediments into the river through the use of silt fences and other erosion control products. After construction, berms and channels would be removed incrementally to minimize pulses of sediment downstream.
- After construction, all temporary structures and excess materials resulting from construction would be removed from the floodplain.
- All disturbed areas, including the main river channel and its floodplain and braided channels under the bridges, would be restored to as near their original conditions as possible by re-contouring and seeding, hydroseeding, planting, or transplanting native plant species.

**Environmental Awareness Training**

- ADOT would arrange for preconstruction environmental awareness training for all personnel working at the bridges including but not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. Training would include information on designated southwestern willow flycatcher and proposed western yellow-billed cuckoo critical habitat, the northern Mexican gartersnake and its proposed critical habitat, proposed critical habitat for the narrow-headed gartersnake, and the razorback sucker and spikedace and designated critical habitat for both of these fish. The program would include information concerning the biology and distribution of these species, legal status, measures to avoid impacts, and procedures to be implemented in case of encounters (additional information on training for the flycatcher, cuckoo, and narrow-headed gartersnake is provided in our concurrences in Appendix A).

**Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo Critical Habitat**

- A biological monitor would be present prior to and during ground disturbing and vegetation removal activities to demarcate riparian vegetation that is to be avoided and retained. Avoidance areas would be indicated by flagging or plastic fencing.
- All project activities would avoid perennial riparian vegetation (i.e., shrubs and trees) to the extent possible, even if not demarcated.

**Northern Mexican Gartersnake and Proposed Critical Habitat**

- Biological monitors would conduct a preconstruction survey for the northern Mexican gartersnake 24 hours prior to the beginning of the geotechnical investigation and before the start of each major phase of the project (e.g., river channelization and pier retrofitting). The purpose of these efforts would be to move snakes before they can be harmed.
- Biological monitors would be present every day that construction activities are underway to conduct periodic checks for snakes ahead of project equipment and personnel.
- All snakes encountered during work at the bridge site would be caught if possible and relocated per provisions in the snake relocation protocol.

- Use of silt fences and/or erosion control products with netting mesh sizes ¼ inch wide or less would be specified as part of the sediment containment plan to prevent entanglement of snakes.

**Razorback Sucker and Spikedace**

- Activities that have the potential to disturb the flowing water of the Verde River would not occur unless a qualified fish biologist holding a section 10 recovery permit has cleared the stream for work per the fish relocation protocol developed for this project.
- Mesh screens ¼ inch wide or smaller would be placed on all water pump intake hoses to reduce harm to suckers and spikedace during dewatering activities.
- Mesh screens would be checked frequently to assure that native fish that are pulled onto the screen and cannot escape are removed by hand before they are harmed.

## STATUS OF THE SPECIES AND DESIGNATED CRITICAL HABITATS

Southwestern Willow Flycatcher Designated Critical Habitat

Critical habitat for the flycatcher was designated on July 22, 1995 (62 FR 39129) and was revised on January 2, 2013 (78 FR 344). The revised critical habitat designation reduced critical habitat rangewide from 1,556 stream mi to approximately 1,227 stream mi. The revised rule designated 208,973 ac of critical habitat for the flycatcher in 24 management units in six states, including Arizona. FWS designated the following primary constituent elements (PCEs) for flycatcher critical habitat based on riparian plant species, structure and quality of habitat, and insects for prey:

1. *PCE 1— Riparian Vegetation.* Riparian habitat along a dynamic river or lakeside, in a natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs (that can include Gooddings willow, coyote willow, Geyer's willow, arroyo willow, red willow, yewleaf willow, pacific willow, boxelder, tamarisk, Russian olive, buttonbush, cottonwood, stinging nettle, alder, velvet ash, poison hemlock, blackberry, seep willow, oak, rose, sycamore, false indigo, Pacific poison ivy, grape, Virginia creeper, Siberian elm, and walnut) and some combination of:

    (a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 2 to 30 meters (m) (about 6 to 98 ft). Lower-stature thickets (2 to 4 m or 6 to 13 ft tall) are found at higher elevation riparian forests and tall-stature thickets are found at middle and lower-elevation riparian forests;
    (b) Areas of dense riparian foliage at least from the ground level up to approximately 4 m (13 ft) above ground or dense foliage only at the shrub or tree level as a low, dense canopy;
    (c) Sites for nesting that contain a dense (about 50 percent to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground);
    (d) Dense patches of riparian forests that are interspersed with small openings of open water or marsh or areas with shorter and sparser vegetation that creates a variety of

habitat that is not uniformly dense. Patch size may be as small as 0.1 hectare (ha) (0.25 ac) or as large as 70 ha (175 ac).

2. *PCE 2—Insect Prey Populations*. A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, which can include: flying ants, wasps, and bees (*Hymenoptera*); dragonflies (*Odonata*); flies (*Diptera*); true bugs (*Hemiptera*); beetles (*Coleoptera*); butterflies, moths, and caterpillars (*Lepidoptera*); and spittlebugs (*Homoptera*).

Western Yellow-billed Cuckoo Proposed Critical Habitat

FWS proposed 546,335 ac of critical habitat for the western yellow-billed cuckoo in 80 units in nine states including Arizona on August 15, 2014 (79 FR 48548). FWS proposed the following PCEs for cuckoo critical habitat:

*PCE 1—Riparian Woodlands*. Riparian woodlands with mixed willow and cottonwood vegetation, mesquite-thorn forest vegetation, or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are greater than 325 feet (100 meters) in width and 200 ac (81 hectares) or more in extent. These habitat patches contain one or more nesting groves, which are generally willow-dominated, have above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.

*PCE 2—Adequate Prey Base*. Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and tree frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.

*PCE 3—Dynamic Riverine Processes*. River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote plant growth, maintenance, health, and vigor (e.g. lower gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously aged patches from young to old.

Northern Mexican Gartersnake and Proposed Critical Habitat

The northern Mexican gartersnake was listed as threatened under the Act on July 8, 2014 (79 FR 38678). Critical habitat was proposed on July 10, 2013 (78 FR 41550) and has not yet been designated.

The northern Mexican gartersnake can reach 44 inches in length and is similar in appearance and may occur with other native gartersnakes. It can be difficult for people without the appropriate expertise to identify this snake.

Throughout its range, this gartersnake occurs at elevations from 130 to 8,497 ft (Rossman et al. 1996). It is considered a “terrestrial-aquatic generalist” by Drummond and Marcías-García

(1983). This gartersnake is often found in riparian habitat, but has also been found hiding under cover in grassland habitat up to one mi from surface water (personal communication from R. Cogan, Conservation Coordinator, Appleton-Whittell Research Ranch, National Audubon Society, April 7, 2015). The subspecies has historically been associated with three general habitat types: 1) source-area wetlands (e.g., cienegas or stock tanks); 2) large-river riparian woodlands and forests; and 3) streamside gallery forests (Hendrickson and Minckley 1984, Rosen and Schwalbe 1988). Emmons and Nowak (2013) found this subspecies most commonly in protected backwaters, braided side channels and beaver ponds, isolated pools near river mainstems, and edges of dense emergent vegetation that offered cover and foraging opportunities. In the northern-most part of its range, the northern Mexican gartersnake appears to be most active from June to September.

The northern Mexican gartersnake is an active predator and is thought to depend heavily on a native prey base (Rosen and Schwalbe 1988). These gartersnakes forage along vegetated streambanks, searching for prey in water and on land, using different strategies (Alfaro 2002). The diet is mainly amphibians and fishes, such as adult and larval (tadpole) native leopard frogs, as well as juvenile and adult native fish (Rosen and Schwalbe 1988), but earthworms, leeches, lizards, and small mammals are also taken. In situations where native prey species are rare or absent, this snake's diet may include nonnative species, including larval and juvenile American bullfrogs (*Lithobates catesbeiana*), western mosquitofish (*Gambusia affinis*) (Holycross et al. 2006, Emmons and Nowak 2013), or other nonnative fishes.

Natural predators of the northern Mexican gartersnake include birds of prey, other snakes, wading birds, mergansers, kingfishers, raccoons, skunks, and coyotes (Rosen and Schwalbe 1988, Brennan et al. 2009). Historically, large, highly predatory native fish species such as Colorado pikeminnow (*Ptychocheilus lucius*) may have preyed upon northern Mexican gartersnakes where they co-occurred.

Sexual maturity in northern Mexican gartersnakes occurs at two years of age in males and at two to three years of age in females (Rosen and Schwalbe 1988). Northern Mexican gartersnakes are viviparous (bringing forth living young rather than eggs). Mating has been documented in April and May followed by the live birth of between 7 and 38 newborns in July and August (Rosen and Schwalbe 1988, Nowak and Boyarski 2012).

The northern Mexican gartersnake historically occurred in every county and nearly every subbasin within Arizona in habitats that included perennial or intermittent creeks, streams, and rivers and lentic wetlands such as cienegas, ponds, and stock tanks (Rosen and Schwalbe 1988, Rosen et al. 2001; Holycross *et al.* 2006). In New Mexico, the gartersnake had a limited distribution that consisted of scattered locations throughout the Upper Gila River watershed in Grant and western Hidalgo Counties (Price 1980, Fitzgerald 1986, Degenhardt *et al.* 1996, Holycross et al. 2006). In Mexico, northern Mexican gartersnakes historically occurred within the Sierra Madre Occidental and on the Mexican Plateau, comprising approximately 85 percent of the total rangewide distribution of the subspecies (Rossman et al. 1996).

The only viable northern Mexican gartersnake populations in the U.S., where the subspecies remains reliably detected, are in Arizona: 1) the Page Springs and Bubbling Ponds State Fish Hatcheries along Oak Creek; 2) lower Tonto Creek; 3) the upper Santa Cruz River in the San

Rafael Valley; 4) the Bill Williams River; and 5) the middle/upper Verde River. In New Mexico and elsewhere in Arizona, the gartersnake may still occur in extremely low population densities. The status of this snake in Mexico and on tribal lands in the U.S. is poorly understood.

We have concluded that in as many as 23 of 33 known localities in the U.S. where this snake occurred (70 percent), its populations are likely not viable and may exist at low enough densities that populations are threatened with extirpation. The northern Mexican gartersnake may already be extirpated in many of these locations. Presence of harmful nonnative species is the most significant reason for the decline of this snake. Harmful nonnative species may include, but are not necessarily limited to, fish in the families Centrarchidae and Ictaluridae, American bullfrogs, and any species of crayfish (e.g., *Orconectes virilis, Procambarus clarkia*). Harmful nonnative species can cause starvation of gartersnakes through competition and may reduce or eliminate recruitment of young gartersnakes through predation. Other threats include alteration of rivers and streams from dams, water diversions, flood-control projects, and groundwater pumping that reduces or eliminates habitat and favors harmful nonnative species. Climate change and drought are also important threats (79 FR 38678).

**Proposed Critical Habitat: Northern Mexican Gartersnake**

Critical habitat for the northern Mexican gartersnake has been proposed in 14 units in portions of Arizona and New Mexico totaling 421,423 ac (78 FR 41550). Within these areas, the PCEs of the physical and biological features essential to gartersnake conservation are:

1. Aquatic or riparian habitat that includes:

    a) Perennial or spatially intermittent streams of low to moderate gradient that possess appropriate amounts of in-channel pools, off-channel pools, or backwater habitat, and that possess a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of processing sediment loads; or
    b) Lentic wetlands such as livestock tanks, springs, and cienegas; and
    c) Shoreline habitat with adequate organic and inorganic structural complexity to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities (e.g., boulders, rocks, organic debris such as downed trees or logs, debris jams, small mammal burrows, or leaf litter); and
    d) Aquatic habitat with characteristics that support a native amphibian prey base, such as salinities less than 5 parts per thousand, pH greater than or equal to 5.6, and pollutants absent or minimally present at levels that do not affect survival of any age class of the gartersnake or the maintenance of prey populations.

2. Adequate terrestrial space (600 ft lateral extent to either side of bankfull stage) adjacent to designated stream systems with sufficient structural characteristics to support life-history functions such as gestation, immigration, emigration, and brumation.

3. A prey base consisting of viable populations of native amphibian and native fish species.

4. An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs, and/or crayfish (*O. virilis, P. clarkia*), or occurrence of these nonnative species at low

enough levels such that recruitment of northern Mexican gartersnakes and maintenance of viable native fish or soft-rayed, nonnative fish populations (prey) is still occurring.

Narrow-headed Gartersnake Proposed Critical Habitat

Critical habitat for the narrow-headed gartersnake, totaling 210,189 ac, was proposed in six units in Arizona and New Mexico on July 10, 2013 (78 FR 41550), but has not yet been designated. Within these areas, the PCEs of the physical or biological features essential to the conservation of the narrow-headed gartersnake consist of the following four components:

1. Stream habitat, which includes:

    a) Perennial or spatially intermittent streams with sand, cobble, and boulder substrate and low or moderate amounts of fine sediment and substrate embeddedness, and that possess appropriate amounts of pool, riffle, and run habitat to sustain native fish;
    b) A natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions such as flows capable of processing sediment loads;
    c) Shoreline habitat with adequate organic and inorganic structural complexity (e.g., boulders, cobble bars, vegetation, and organic debris such as downed trees or logs, debris jams), with appropriate amounts of shrub- and sapling-sized plants to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities; and
    d) Aquatic habitat with no pollutants or, if pollutants are present, levels that do not affect survival of any age class of the narrow-headed gartersnake or the maintenance of prey populations.

2. Adequate terrestrial space (600 ft lateral extent to either side of bankfull stage) adjacent to designated stream systems with sufficient structural characteristics to support life-history functions such as gestation, immigration, emigration, and brumation.

3. A prey base consisting of viable populations of native fish species or soft-rayed nonnative fish species.

4. An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs (*Litobates catesbeianus*), and/or crayfish (*Orconectes virilis*, *Procambarus clarki*, etc.), or occurrence of these nonnative species at low enough levels such that recruitment of narrow-headed gartersnakes and maintenance of viable native fish or soft-rayed, nonnative fish populations (prey) is still occurring.

Razorback Sucker and Designated Critical Habitat

The razorback sucker was listed as endangered in 1991 (56 FR 54957). Critical habitat for this sucker was designated in 1994 (59 FR 13374). A recovery plan for the species was developed in 1998 (U.S. Fish and Wildlife Service [USFWS] 1998) and was amended in 2002 to include quantitative recovery goals (USFWS 2002). A 5-year status review was completed in 2012 (USFWS 2012). It was determined that a change to the species' endangered status was not warranted.

A desert fish, this sucker is the only representative of the genus *Xyrauchen* and is endemic to the Colorado River Basin (Minckley and Marsh 2009). It is distinguished from other suckers (Family Catostomidae) by the predorsal keel that rises abruptly behind the head and ends at the dorsal fin. The razorback may reach lengths of 3.3 ft and weigh up to 13 pounds (Minckley 1973). Razorbacks more commonly reach about half that size and weight (Minckley 1991). Razorbacks may live more than 40 years (McCarthy and Minckley 1987, Minckley et al. 1991).

Diet of this sucker varies depending on life stage, habitat, and food availability. Larvae feed mostly on phytoplankton, zooplankton, and detritus (Minckley and Marsh 2009). Diet of juveniles is generally unknown but is probably similar to that of larvae, perhaps with larger food items taken. Adults in reservoirs are largely planktivorous. Diet of adults taken from rivers consists chiefly of immature mayflies, caddisflies, and midges, along with algae, detritus, and inorganic material (USFWS 1998).

Adult razorbacks use most of the available habitats in the river systems where they occur, although they may avoid whitewater habitats. Habitats in main channels tend to have low velocities and may include pools, eddies, nearshore runs, and channels associated with sand or gravel bars (Bestgen 1990). Backwaters, oxbows, sloughs, and flooded bottomlands adjacent to the main channel are also used. In reservoirs, adults use all habitat types, but prefer backwaters and the main impoundment (USFWS 1998).

Male razorbacks usually mature in 2-3 years and females in 3-5 years (Minckley and Marsh 2009). During spawning they make directed movements, sometimes of substantial distance, towards traditional spawning areas (Osmundson and Kaeding 1989, Tyus and Karp 1990). Spawning usually takes place from late winter to early summer. Suitable water temperatures for spawning, egg incubation, and growth range from 14 to 25°C (USFWS 2002, Valdez and Speas 2007). Hatching success is temperature dependent, with the potential for complete egg mortality occurring at temperatures less than 10°C (USFWS 2002).

Much of the available information on spawning behavior and habitat comes from reservoirs. In reservoirs, spawning occurs along shallow shorelines in water three to10 ft deep (Minckley et al. 1991). Larvae in reservoirs are found in shallow backwater coves or inlets (USFWS 1998). In rivers, captures of larvae have occurred in backwaters, creek mouths, wetlands, and flooded bottomlands.

Historically, razorbacks were abundant throughout the larger streams of the Upper and Lower Colorado River Basins from the Green River in Wyoming to the Gulf of California in Sonora, Mexico (USFWS 2002, Day et al. 2017). Razorbacks were among the most abundant of the big river fishes in the Basin. However, the species' range contracted and its numbers were substantially reduced over the last half century as a result of dam construction, water diversions, habitat alteration and fragmentation, and invasion of degraded habitats by a host of nonnative predacious and competitive fish species. Although razorbacks produce large spawns each year and produce viable young, the larvae are preyed on by nonnative fish (Minckley et al. 1991). Razorbacks in the Lower Colorado River maintained populations long after the river became a string of impoundments. These populations persisted almost solely because of the species' longevity, not by documented recruitment into the populations. In Lake Mohave, tens of thousands of razorbacks persisted for decades, but the population declined and by the 1980s only

a remnant population remained. Twenty years later this natural population was functionally extinct (Marsh et al. 2015, Kesner et al. 2016).

Today razorbacks are actively stocked into habitats in the upper and lower basins to prevent extirpation of the species from the wild. Development of propagation techniques began in 1974 with the collection of 40 wild adults from Lake Mohave. These early efforts launched more than 30 years of intensive rearing and the release of more than 15 million fish at 200 locations (Day et al. 2017). The stocking efforts rely on captive broodstocks and the capture of wild-born larvae from Lake Mead and Lake Mohave to provide sub-adult fish for stocking programs.

Current propagation practices focus on maximizing growth in captivity to increase survival upon release. Enhanced release strategies are a focus in part because mass releases of young fish were largely unsuccessful probably due to predation by nonnative fish (Day et al. 2017). Some degree of reproduction is currently occurring at three locations in Lake Mead (Albrecht et al. 2008, Kegerries and Albrecht 2011) and another spawning group was documented in 2010 at the Colorado River inflow area of the lake (Albrecht et al. 2010, Kegerries and Albrecht 2011, 2012). Until recently, the razorback was considered to be extirpated from the Grand Canyon; however, in 2012 and 2013 adult razorback suckers were captured in western Grand Canyon (National Park Service 2013). In 2014 and 2015, razorback larvae were documented as far upstream as Lava Falls (Albrecht et al. 2014, Kegerries et al. 2015). The razorback also occurs in the Green River in the upper Colorado River basin; in the San Juan River subbasin above Lake Powell and in Lake Powell; in the lower Colorado River between Lake Havasu and Davis Dam; and in the Gila River subbasin (USFWS 2002, Francis et al. 2015).

In spite of the advancements made in artificial propagation, the range-wide trend for the razorback sucker is a continued decrease in wild populations. Predation on eggs and larvae by nonnative fish species continues to restrict natural recruitment throughout the Colorado River Basin and no self-sustaining populations have been established. Conflicting ideals between native fish management and proponents of recreational fisheries continues to stymie nonnative fish removal. As a result, the prognosis for the species remains poor (Day et al. 2017). Marsh et al. (2015) considers it unlikely that naturally self-sustaining populations of this sucker are possible, and that the species will remain “conservation reliant.” However, nonnative-free backwaters have promise for the conservation of this species and other native big-river fishes.

**Designated Critical Habitat: Razorback Sucker**

Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker and includes portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the upper basin, and the Colorado, Gila, Salt, and Verde rivers in the lower basin, totaling 1,724 river mi (59 FR 13374). Within that area, the primary constituent elements (PCEs) of the physical and biological features essential to razorback conservation are:

*PCE 1—Water*. This includes a quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminations, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage.

*PCE 2—Physical Habitat.* This includes areas of the Colorado River system that are inhabited by razorback suckers or potentially habitable for use in spawning, nursery, feeding, rearing, or

corridors between these areas. In addition to river channels, these areas also include bottomlands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year floodplain, which, when inundated, provide spawning, nursery, feeding, and rearing habitats.

*PCE 3—Biological Environment*. Food supply, predation, and competition are important elements of the biological environment and are considered components of this constituent element. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the razorback sucker. Predation, although considered a normal component of this environment, may be out of balance due to introduced fish species in some areas. This may also be true of competition, particularly from nonnative fish species.

Spikedace and Designated Critical Habitat

The spikedace was originally listed as a threatened species on July 1, 1986 (51 FR 23769). A recovery plan for the species was completed in 1991 (USFWS 1991). The species was reclassified as endangered on February 23, 2012 (77 FR 10810). Critical habitat was designated in 1994, revised in 2000 and 2007, and finalized in 2012 when the species was uplisted as endangered (77 FR 10810).

Spikedace live in flowing water with slow to moderate velocities over sand, gravel, and cobble substrates (Propst et al. 1986, Rinne and Kroeger 1988). Spikedace spawn from March through May with some yearly and geographic variation (Propst et al. 1986). Actual spawning has not been observed in the wild, but spawning behavior and captive studies indicate eggs are laid over gravel and cobble where they adhere to the streambed. The species feeds primarily on aquatic and terrestrial insects (Schreiber 1978, Marsh et al. 1989).

The spikedace was once common throughout much of the Gila River Basin, including the mainstem Gila River upstream of Phoenix, and the Verde, Agua Fria, Salt, San Pedro, and San Francisco subbasins. Habitat destruction and competition and predation by nonnative aquatic species reduced its range and abundance (Miller 1961, Propst et al. 1986). Spikedace are now restricted to portions of the upper Gila River (Grant, Catron, and Hidalgo Counties, New Mexico); Aravaipa Creek (Graham and Pinal Counties, Arizona); Eagle Creek (Graham and Greenlee Counties, Arizona); and the Verde River (Yavapai County, Arizona) (Marsh et al. 1990, Stefferud and Reinthal 2005, Propst 2007).

Spikedace have recently been placed in additional streams as part of the recovery efforts for the species. In 2007, spikedace were translocated into Hot Springs Canyon, in Cochise County, Arizona, and Redfield Canyon, in Cochise and Pima Counties, Arizona, and these streams were subsequently augmented (Robinson 2008a; Robinson et al. 2013a). Both Hot Springs and Redfield canyons are tributaries to the San Pedro River. Augmentation efforts have been suspended in Redfield Canyon due to drought and a lack of adequate flowing water. Augmentation efforts have been suspended at Hot Springs Canyon because releases have failed to produce a viable population.

Spikedace were also released in Fossil Creek, a tributary to the Verde River in Gila County, Arizona, in 2007, and additional releases occurred in 2008, 2011, and 2012 (Carter 2007, Carter

2008, Robinson 2009, Robinson 201lb, Love-Chezem et al. 2015). Spikedace continue to be detected in Fossil Creek (Robinson et al. 2014 ).

In 2008, spikedace were translocated into Bonita Creek, a tributary to the Gila River in Graham County, Arizona (H. Blasius, U.S. Bureau of Land Management [BLM], personal communication, 2008; Robinson et al. 2009b), and were repatriated to the upper San Francisco River in Catron County, New Mexico (D. Propst, New Mexico Department of Game and Fish, personal communication, 2010). Augmentations at Bonita Creek have been suspended due to re-invasion by nonnative species above a fish barrier. Spikedace were also translocated to the San Francisco River in New Mexico in 2008 and were detected using eDNA and during monitoring efforts in 2017 (M. Richardson, USFWS Spikedace Species Lead, personal communication, November 7, 2017). Spikedace were also translocated into the Blue River in 2012, are were present in that stream in 2013 (Robinson et al. 2013b).

Spikedace is common only in Aravaipa Creek in Arizona (P. Reinthal, University of Arizona, personal communication, 2011) and one section of the Gila River south of Cliff, New Mexico (Propst et al. 2009). The Verde River is presumed occupied; however, the last captured fish from this river was from a 1999 survey (72 FR 10810). Spikedace from the Eagle Creek population have not been seen for over a decade, although they are still thought to exist in numbers too low for sampling efforts to detect (Carter et al. 2007; Minckley and Marsh 2009). On the Middle Fork of the Gila River in Arizona, the population is thought to be very small and spikedace have not been seen there since 1991 (Jakle 1992), but sampling has been localized and inadequate to detect a sparse population.

**Designated Critical Habitat: Spikedace**

The spikedace critical habitat designation includes 630 river mi in eight units based on river subbasins. These include the Verde River, Salt River, San Pedro, Bonita Creek, Eagle Creek, San Francisco River, Blue River, and Gila River subbasins in western New Mexico and central and southern Arizona (77 FR 10810). The PCEs for spikedace critical habitat are as follows:

1. Habitat to support all egg, larval, juvenile, and adult spikedace, which includes:

    1a. Perennial flows with a stream depth generally less than 1 meter (3.3 feet), and with slow to swift flow velocities between 5 and 80 centimeters per second (1.9 and 31.5 inches per second).
    1b. Appropriate stream microhabitat types including glides, runs, riffles, and the margins of pools and eddies, and backwater components over sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness.
    1c. Appropriate stream habitat with a low gradient of less than approximately 1.0 percent, at elevations below 2,100 meters (6,890 feet).
    ld. Water temperatures in the general range of 8.0 to 28.0 °Celsius (46.4 to 82.4 degrees Fahrenheit).

2. An abundant aquatic insect food base consisting of mayflies, true flies, black flies, caddisflies, stoneflies, and dragonflies.

3. Streams with no or no more than low levels of pollutants.

4. Perennial flows, or interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

5. No nonnative aquatic species or levels of nonnative aquatic species that are sufficiently low as to allow persistence of spikedace.

6. Streams with a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of transporting sediments.

## 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 River and Floodplain

The Verde River is a major tributary of the Salt River in central Arizona. It flows generally south from Sullivan Lake Dam, near the Town of Paulden, Yavapai County, and joins the Salt River east of Phoenix. Sullivan Lake has mostly filled in with sediment (Wirt 2005); thus, the river is essentially free flowing and perennial from Sullivan Lake Dam downstream to Horseshoe Reservoir, a distance of over 100 mi (Arizona Department of Water Resources [ADWR] 2017).

Stream flows at the Verde River bridges can be substantial given high elevations (over 12,000 ft at Humphrey's Peak) upstream of the bridges and associated high rainfall and snowfall. Many major and minor springs also contribute to annual flows. Stream flow data from a U.S. Geological Survey (USGS) stream gauge near the Town of Camp Verde show that variable flows occurred from January 2010 to September 2017 ranging from under 100 cubic feet per second (cfs) to over 20,000 cfs (USGS 2017). Flows approaching or exceeding 10,000 cfs occurred in 2010, 2013, and 2017.

The Verde River approaches I-17 and its southbound bridge from the west as one main channel. As the river flows beneath the southbound bridge, it begins to meander and slow, bends sharply north, and breaks up into multiple narrower channels with backwaters and pools that flow around six of the 12 piers. As the river exits the northbound bridge it bends sharply east and forms again into one main channel.

Immediately upstream of the bridges the Verde River flows through a broad floodplain composed of exposed soils, sand, and cobble that extend 500-600 ft northeast of the main river channel. The floodplain in this area is highly disturbed. Public access is readily available from

dirt and gravel roads that tie into paved county and municipal roads. Evidence of human activity is obvious in this area and includes trash, makeshift campsites and fire pits under the bridges, graffiti on the bridge piers, foot trails, and truck and ORV tracks that crisscross the floodplain and parallel the river channel. Open, parklike stands of mature cottonwood and willow separate the zone of exposed cobble from residential areas 0.2 to 0.3 mi northeast of the river. These parklike areas are also heavily used by the public. On the other side of the river, the floodplain consists of farmland, pasture land, and upland desert scrub.

Because the river bends north at the bridges, the downstream floodplain lies to the south and southeast of the river's mainstem. The 124-ac Camp Verde Riparian Preserve (CVRP; see Figure 1) encompasses most areas directly downstream of the bridges; thus, floodplain characteristics and vegetation there are distinct from upstream areas (see below). The CVRP is managed by the Salt River Project, a public utility. It begins at the northbound bridge and extends to the southeast for 0.75 mi. The CVRP is a mitigation property established to compensate for the loss of riparian habitat resulting from operation of the Roosevelt Dam on the Salt River after the dam was raised in 1996.

**Vegetation**

Riparian vegetation within the construction footprint and project area is characteristic of Interior riparian deciduous forest (Brown 1994) and includes Goodding's willow (*Salix gooddingii*), coyote willow (*Salix exigua*), seepwillow (*Baccharis salicifolia*), Fremont cottonwood (*Populus fremontii*), tamarisk (*Tamarix* spp.), and velvet ash (*Fraxinus velutina*).

Upstream of the bridges, galleries of mature cottonwood, willow, and ash up to 100 ft wide occur in bands on both sides of the river's main channel. These galleries lack well-developed, dense understories of smaller trees. Instead, the understories are composed primarily of low-lying shrubs, tall grasses, and forbs. Disturbed areas (cobble and bare soils) adjacent to the galleries are nearly devoid of vegetation. The parklike stands of trees between the open cobble and residential areas to the northeast have no understory development other than grasses.

Vegetation downstream of the bridges is more developed than in upstream areas. Open cobble and exposed soils occur near the bridges but vegetation quickly increases in density and height as distance from the bridges increases. The majority of the preserve (about 85 ac) is a mature, multi-layered cottonwood/willow gallery with a dense understory that includes tamarisk. Riparian vegetation is persisting and thriving on much of the CVRP, and new stands of willow are becoming established on the downstream portion of the property.

Status of the Species and Critical Habitats in the Action Area

**Southwestern Willow Flycatcher Designated Critical Habitat**

The action area is within the 9.5-mi-long Upper Verde River Management Unit which extends from about the Town of Cottonwood downstream past the Verde River bridges and past the Town of Camp Verde (78 FR 344). Thus, designated flycatcher critical habitat occurs upstream and downstream of the Verde River bridges and the 6.2-ac construction footprint occurs entirely within that critical habitat.

As detailed above, the PCEs of designated flycatcher critical habitat include (1) riparian vegetation, and (2) insect prey populations.

*PCE 1 (Riparian Vegetation)*

Bands of mature gallery forest along the main channel upstream of the bridges are only marginally suitable for flycatcher breeding because they lack dense, well developed understories. Narrow strips of riparian vegetation on the braided stream banks under the bridges also lack the structural and spatial development required for breeding. These habitats could provide migratory stopover and foraging habitat for flycatchers. Habitat becomes increasingly suitable for flycatchers downstream of the bridges within the CVRP. Breeding records are available from the CVRP, as described in Appendix A.

*PCE 2 (Insect Prey Populations)*

We have no data on insect prey populations, but judging from the mosaic of habitats at and near the bridges, including the main river channel, backwaters, pools, and riparian vegetation along the river, we assume that flying insect prey are available to flycatchers. Insect prey may be more available downstream of the bridges in the CVRP where density of riparian habitat is higher.

**Western Yellow-billed Cuckoo Proposed Critical Habitat**

The action area is within the proposed 2,053-ac, 18-mi-long Lower Verde/West Clear Creek Critical Habitat Unit in Yavapai County. The unit begins at the northbound Verde River bridge and extends downstream about four mi past the West Clear Creek confluence (79 FR 48548). Proposed critical habitat for the cuckoo does not occur upstream of the northbound bridge; thus, about 3.0 ac of the construction footprint occurs within proposed critical habitat for this species.

PCEs of proposed critical habitat for the cuckoo include (1) riparian woodlands; (2) adequate prey base; and (3) dynamic riverine processes.

*PCE 1 (Riparian Woodlands)*

Riparian vegetation on the floodplain immediately downstream of the bridges consists of open, scattered shrubs and trees (less than 50 percent canopy closure), and discontinuous, narrow galleries of cottonwood/willow on the streambanks with tamarisk intermixed as understory layers or as small monotypic stands. Although these areas do not meet the extent of habitat described for nesting and foraging as currently defined for this PCE in the critical habitat proposed rule, based on cuckoo breeding habitat descriptions in Arizona, the area may provide suitable foraging and migration habitat, and potentially nesting habitat. Suitable breeding habitat for cuckoos occurs in the CVRP further downstream and multiple detections of cuckoos during protocol surveys have occurred there in recent years (see Appendix A).

*PCE 2 (Adequate Prey Base)*

Our comments on insect prey populations for the flycatcher (above) are generally the same for the cuckoo. We assume that large insect prey species are available to cuckoos within the construction footprint and downstream in the CVRP.

*PCE 3 (Dynamic Riverine Processes)*

This PCE emphasizes river systems that are perennial and dynamic and encourage sediment movement and deposits for seedling germination and growth. Low gradients and broad floodplains with elevated subsurface groundwater tables are also important. The Verde River is largely unregulated upstream of the bridges, is essentially free flowing, floods periodically, and is perennial throughout its length. The fact that healthy, regenerating riparian habitat occurs in the CVRP is evidence that PCE 3 is not deficient within the action area.

**Northern Mexican Gartersnake and Proposed Critical Habitat**

Surveys for this gartersnake were not done for the purposes of this project, but research and monitoring efforts have occurred throughout the species' range in Arizona, and have included the Verde River Basin. From 2012 to 2015, the Arizona Game and Fish Department (AGFD) conducted intensive research at seven sites on and adjacent to the Verde River (Emmons and Nowak 2016). Study sites extended from Pecks Lake, north of Cottonwood, downstream to the CVRP, the southernmost study site. The study focused on gartersnake demography, habitat use, food habits, prey populations, and movements. Of 168 snakes trapped or observed during the project, 105 (62 percent) were in the CVRP. The remaining 63 detections occurred at four of the six study sites that were upstream of the CVRP.

*Critical Habitat*

The action area is within the Upper Verde River Subbasin proposed northern Mexican gartersnake critical habitat unit. This unit includes the mainstem of the Verde River from Sullivan Lake to the headwaters of Horseshoe Reservoir (20,526 ac and 139.8 river mi). Proposed critical habitat includes the low-flow channel of the Verde River and 600 ft of the floodplain adjacent to the river (78 FR 41550). Proposed critical habitat for the species extends upstream and downstream of the Verde River bridges. All 6.2 ac of the construction footprint occur within proposed critical habitat.

PCEs of this gartersnake's proposed critical habitat are (1) aquatic or riparian habitat; (2) terrestrial space; (3) native prey base; and (4) absence of nonnative species.

*PCE 1 (Aquatic or Riparian Habitat)*

Habitat conditions at the Verde River bridges exhibit most of the characteristics of PCE 1. As we discussed above, the river here is free flowing, perennial, has a low gradient, floods periodically, and has instream cobble and boulders, pools, and backwaters. The river banks and riparian vegetation have the organic and inorganic structural complexity (boulders, woody debris, litter, and cover) necessary for gartersnake shelter, foraging, and other life functions.

*PCE 2 (Terrestrial Space)*

The spatial extent required to meet the requirements of PCE 2 (600 ft lateral extent of bankfull stage) are present at the Verde River bridges. The floodplain upstream of the bridges is open, exposed, and has little vegetation; however, northern Mexican gartersnakes have been observed in sparse vegetation well away from a water source (J. Servoss, USFWS, personal

communication, September 28, 2017). The floodplain has cobble and rock piles to provide cavities for escape, brumation, and gestation. Terrestrial space requirements improve downstream where vegetation density and cover increases. In addition, both bridges have rail banks below the bridge abutments, consisting of boulders and rocks contained by heavy duty wire mesh that stabilizes the slopes where I-17 roadways intersect the bridges. The rail banks likely are being used by snakes as cover and may provide cover for displaced snakes during construction.

*PCE -3 and 4 (Native Prey Base and Absence of Nonnative Species)*

During their three-year study, Emmons and Nowak (2016) documented three native fish species in the Verde River Basin: desert sucker (n=34), Sonora sucker (n=3), and speckled dace (n=1). In contrast, the authors reported over 11,000 mosquito fish, over 5,000 green sunfish, nearly 800 largemouth bass, and in total hundreds of individuals of seven other nonnative fish species. They also documented nearly 4,000 bullfrogs (tadpoles to adults) and over 800 crayfish.

**Narrow-headed Gartersnake Proposed Critical Habitat**

The action area is within this gartersnake's Verde River Subunit proposed critical habitat area which includes 18,721 ac and 127.5 river mi of the river, from Sullivan Lake downstream to Red Creek near Childs, Arizona (78 FR 41550). Proposed critical habitat for the species extends upstream and downstream of the Verde River bridges; thus, all 6.2 ac of the construction footprint occur within proposed critical habitat.

The PCEs of proposed critical habitat for the narrow-headed gartersnake are essentially the same as the northern Mexican gartersnake. See our description above for the northern Mexican gartersnake.

**Razorback Sucker and Designated Critical Habitat**

No surveys of the razorback sucker were done for the purposes of this project, but recent releases by AGFD near the Verde River bridges indicate that razorbacks may occur within the construction footprint. Releases occurred at Beasley Flat, four mi downstream of the bridges each year from 2003 to 2005, in 2007, in 2010 and 2011, and 2016 (T. Love-Chezem, AGFD, personal communication, 2016). Fish monitoring in the CVRP (see Emmons and Nowak 2016) resulted in no captures or observations of razorback suckers; however, these surveys and capture methods were not designed specifically to document occurrence of the razorback sucker. Minnow traps were used in the study, as opposed to seining and electrofishing, which would have been more likely to detect suckers (J. Gwinn, USFWS, personal communication, January 8, 2018).

*Critical Habitat*

Designated critical habitat for the razorback sucker includes the Verde River and its 100-year floodplain from the Prescott National Forest boundary near Paulden downstream to Horseshoe Dam, including Horseshoe Reservoir to its full pool elevation (59 FR 13374). Thus, all 6.2 ac of the construction footprint for the proposed action fall within razorback sucker designated critical

habitat. Note that the rule designating critical habitat for this species does not provide the number of acres or river miles encompassed by the Verde River critical habitat unit.

PCE's of critical habitat for the razorback sucker include (1) water; (2) physical habitat; and (3) biological environment.

*PCE 1 and 2 (Water and Physical Habitat)*

The PCEs of water and physical habitat have not been highly altered in the construction footprint by construction of large dams. Sullivan Dam, at the Verde's headwaters, is essentially non-functional, and the action area has a constant supply of water. The main low-flow channel and braided areas at the Verde River bridges provide the low water velocities, cobbled substrates, rocky areas, riffles, backwaters, and pools to satisfy most of the sucker's needs at each life stage. Seasonal flooding and periodic floods approaching or exceeding 10,000 cfs, (as in 2010, 2013, and 2017) should provide side channels, secondary channels, and flooded backwaters important for spawning and rearing. Google Earth images (accessed November 6, 2017) indicate that habitat conditions are similar well upstream and downstream of the bridges; thus, these PCEs do not appear to be deficient in the construction footprint or action area.

*PCE 3 (Biological Environment)*

Food supply, predation, and competition are important elements of the biological environment. We have no information on food supply available to razorbacks in the action area, but we assume it is not deficient, given the river's natural hydrograph and variety of physical habitats. However, predation and competition, although considered normal components of the environment, are severely out of balance. As we discussed above, nonnative fishes dominate the system and bullfrogs and crayfish are also present.

**Spikedace and Designated Critical Habitat**

No spikedace surveys were done for the purposes of this project, but data from a number of studies indicate that the likelihood of this fish occurring within the action area or construction footprint is small. Spikedace surveys by various parties (USFWS, AGFD, U.S. Forest Service [USFS]) have occurred upstream of the construction footprint between Granite Creek and Sycamore Creek every two to three years since 2005, the latest in 2017 (M. Richardson, USFWS, personal communication). No spikedace captures or detections have occurred during these surveys. Fish sampling done upstream and downstream of the construction footprint, including the CVRP, as part of the northern Mexican gartersnake study (Emmons and Nowak 2016), did not result in captures or observations of spikedace. Recent, limited eDNA samples collected for spikedace in the upper Verde found no spikedace DNA, and the last confirmed capture of this fish in the Verde River occurred in 1999 (72 FR 10810).

As we noted above, spikedace were translocated into Fossil Creek, about 30 mi downstream of the construction footprint, in 2007, 2008, 2011, and 2012. The species was detected there in 2014 (Robinson et al. 2014) and 2016, and AGFD considers this population to be "established" (M. Richardson, USFWS, personal communication.). However, given the prevalence of nonnative fish in the Verde River's main stem, it is unlikely that these fish would provide a source population for the upper Verde River.

*Critical Habitat*

The Verde River Subbasin designated critical habitat unit extends from Sullivan Lake Dam downstream to the confluence of Fossil Creek (about 106 river mi) (77 FR 10810).

All six of the PCEs of designated critical habitat for the spikedace have been described above and our discussions of PCEs for the flycatcher, cuckoo, both gartersnakes, and razorback sucker in general are relevant to the spikedace. Perennial flows, recurrent flooding, and adequate river function are characteristic of the action area. Data on pollutant levels are not immediately available; however, Wirt (2006) noted that the Verde River is particularly valued as a municipal water supply because of its high water quality. Thus, PCEs 1-4 and PCE 6 do not appear to be deficient. However, PCE 5 (absence of nonnative species) is severely deficient and appears to be the primary reason that the spikedace is rare in the Verde River.

Factors Affecting the Species and Critical Habitat in the Action Area

In our discussions above, three primary factors emerge as important influences on the species covered in this BO/CO and their critical habitats: (1) streamflows; (2) human disturbance; and (3) presence of nonnative species in the Verde River.

**Streamflows**

We have seen that the Verde River within the action area maintains vegetation and flow characteristics necessary for flycatchers, cuckoos, and northern Mexican gartersnakes, especially in the CVRP. However, the river's ability to maintain conditions for listed species over the long-term is not assured. One reason for this is that drought or drought-like conditions have occurred throughout much of Arizona since 2009 (ADWR 2016). In addition, groundwater storage in the upper Verde River watershed has declined due to groundwater pumping and streamflow diversions for agricultural, municipal, and industrial developments (Wirt 2006). Populations of cities and towns within the Verde River watershed have more than doubled in the last 20 years, and current trends indicate that populations will double again in the next 20 years (72 FR 10810). Thus, reduced base flows and loss of perennial conditions as a result of increasing water demand in the Verde River basin represent significant threats to listed species in the action area over the long-term.

**Human Disturbance**

Riparian vegetation immediately upstream of the Verde River bridges should exhibit the riparian habitat development that is evident downstream within the CVRP. The hydrograph is the same in both areas, yet the dense cottonwood/willow associations in the CVRP are absent upstream of the bridges. We attribute the lack of mature riparian woodland habitat immediately upstream of the Verde River bridges primarily to public use that has prevented establishment of riparian vegetation on the floodplain. We note as well that perimeter fencing is in place around much of the CVRP. This has likely maintained habitat conditions for flycatchers, cuckoos, and other riparian species.

**Presence of Nonnative Species**

The presence of harmful nonnative aquatic species (in particular, fish species in the families Centrachidae and Ictaluridae, bullfrogs, and crayfish) is the primary factor responsible for the difficulties in establishing self-sustaining populations of the spikedace and razorback sucker in the Verde River. However, a robust population of northern Mexican gartersnakes is present in the CVRP in spite of the dominance of the Verde River by nonnative species. About 62 percent of all detections of this snake by Emmons and Nowak (2016) occurred in the CVRP. A number of gartersnake prey items there were documented in that study, including bullfrogs, (mostly tadpoles [n=23]), largemouth bass (n=2), mosquitofish (n=4), black bullhead (*Ameiurus melas*; n=1), and the native Woodhouse's toad (*Anaxyrus woodhousii*; n=1). Emmons and Nowak (2016) commented that plasticity in prey use in nonnative-dominated systems has allowed areas like the CVRP to sustain viable populations of the northern Mexican gartersnake. The effect of dense vegetative cover in the CVRP is also thought to strongly benefit gartersnakes by reducing predation and improving recruitment in the population (J. Servoss, USFWS, personal communication).

## EFFECTS OF THE ACTION

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

Southwestern Willow Flycatcher Designated Critical Habitat

Much of the 6.2 ac of designated flycatcher critical habitat that would be affected by the proposed action is disturbed open cobble or bare ground and is unsuited for flycatcher use as nesting, foraging, or migration. Minor amounts of vegetation in these areas would be crushed or cleared for the geotechnical investigation and for establishing staging and stockpiling areas.

Most ground disturbance and vegetation removal would occur when the river is re-channeled away from the bridges to establish dry work areas at 12 piers (Figure 2). The Phase 1 channel would require removal of narrow strips of cottonwoods and willow, several trees wide, on the braided stream banks under the bridges, and removal of scattered shrubs and trees on the adjacent downstream floodplain. This vegetation lacks the structural and spatial development required for breeding but could be used for foraging or during migration.

The Phase 2 channel would affect the band of mature cottonwoods and willow that parallel the main stem of the river upstream of the bridges and the strips of vegetation on the braided streambanks under the bridges. The mature forests along the main stem are only marginally suitable for flycatcher breeding because they lack dense, well developed understories. Trees over 12 inches in diameter would be avoided to the extent possible during construction.

Vegetation clearing would result in a reduction of PCE 1—riparian vegetation—within the construction footprint. Removal of trees and vegetation in the footprint would also reduce habitat for flycatcher prey species, thereby directly affecting PCE 2—adequate insect prey. However, project-related effects in the 6.2-ac footprint would be minimal in comparison to the 85 ac or more of suitable nesting, foraging, migration, and prey habitat in the CVRP, and would not diminish the conservation role of critical habitat for the flycatcher within the action area. In addition, the long-term effects of vegetation removal would be mitigated by a planned re-vegetation program after the project is completed. Most effects of the project to flycatcher critical habitat would be temporary, and re-vegetation efforts may enhance flycatcher habitat over the long term.

Western Yellow-billed Cuckoo Proposed Critical Habitat

Effects to proposed critical habitat for the cuckoo overall would be similar to the flycatcher, although critical habitat for the cuckoo within the construction footprint is about half that of the flycatcher. All proposed cuckoo critical habitat is downstream of the bridges. This area includes the low-flow channel, floodplain, and riparian vegetation that is less disturbed than it is upstream of the bridges. The staging area lies outside cuckoo critical habitat, and one of the bypass channels (the Phase 1 channel) will occur within cuckoo critical habitat. The Phase 1 channel will result in the temporary loss of scattered cottonwood, willow and tamarisk and ground disturbance to about 2.1 ac that would be restored after the project is completed. As with the flycatcher, nearly all effects to proposed cuckoo critical habitat would be temporary and would be minimal in comparison to the 85 ac or more of suitable nesting, foraging, migration, and prey habitat in the CVRP. The effects of the proposed action would not diminish the ability of the proposed critical habitat in the action area to serve its conservation role for the cuckoo.

Northern Mexican Gartersnake and Proposed Critical Habitat

Given that there is a robust population of gartersnakes in the CVRP downstream of the I-17 bridges, and suitable habitat is present under and upstream of the bridges, we consider all areas within the construction footprint to be occupied by the northern Mexican gartersnake. Effects to gartersnakes resulting from the project would depend on the timing and nature of construction events and the species' seasonal activities and habits.

At similar elevations in Arizona (about 3,200 ft at the I-17 bridges), these snakes are active primarily from March to late October. They occupy winter retreat den sites (hereafter dens or retreats) from November to February. Throughout the year, they spend a disproportionate amount of time subsurface and often are not visible (Sprague 2017). However, they may be seen aboveground during any month (Emmons and Nowak 2016; J. Servoss, USFWS, personal communication). On the Verde River, dens and other retreats were 1.5 to 500 ft from the nearest permanent water and typically occurred in cavities under downed wood, debris, boulders or in rodent burrows (Emmons and Nowak 2016).

All project-related activities would require access into the floodplain by trucks, backhoes, bulldozers, cranes, and other equipment. The geotechnical investigation is scheduled to occur for one day between May and August 2018. Percolation pits would be filled in immediately afterwards; thus, there is little likelihood of snakes being trapped in the percolation pits.

After the geotechnical investigation, vehicle activity would vary but would be a regular and nearly daily occurrence for six months. Given that snakes could be active at any time during the project, and that vehicle use will increase above normal levels, the risk to snakes from vehicle strikes would increase accordingly. Death or injury of snakes due to vehicle strikes on roads is a well-known form of mortality for this species, even when vehicles travel at extremely low speeds (J. Servoss, USFWS, personal observation).

Noise levels and vibrations associated with heavy equipment operations and other activities would also increase above normal levels and may affect snake behavior by triggering flight responses or by increasing the time snakes spend in their dens or retreats. In any case, snakes may be crushed in their retreats or as they attempt to escape or move between retreats. Snakes that attempt to leave disturbed areas may be captured and relocated by biological monitors; however, snakes that stay or go underground—i.e., that are not caught—would be at especially high risk of crushing. Snakes would also be at risk when stockpiled rocks, cobble, and soil removed during channelization and other activities are returned to the floodplain. Stockpiled materials would provide ideal escape cover and dens for snakes during the project.

In short, snakes could be crushed in their retreats, in their dens, on the surface, or anywhere surface disturbances occur at any time during the project.

Project effects would also include increased sedimentation within and downstream of the construction footprint as a result of erosion, especially during excavation and removal of bypass channels and berms used to divert water around the bridges. Streambank destabilization also may occur as a result of vegetation removal. Increased turbidity may reduce foraging success of snakes because potential prey would be harder to detect, and turbidity may cause potential prey species to move downstream away from the construction footprint. Increased turbidity and sedimentation could also impact fish and amphibian breeding habitat by embedding (filling) downstream spawning and egg deposition areas with sediments. Prey for these snakes would also be reduced when native fish are relocated downstream of the construction footprint during dewatering of the work area, and when nonnative species are euthanized. Increased mortality of amphibians on roads and on the floodplain due to crushing by vehicles—i.e., during wet periods when an influx of newly metamorphosed amphibians could occur—also affect prey availablility (J. Servoss, USFWS, personal observation).

Other effects of the project may include increased vulnerability of snakes to predation and alteration of proposed critical habitat. Because snakes are likely to be displaced by construction activities throughout the life of the project, their exposure and vulnerability to predators will increase accordingly. In addition, vegetation removal will reduce escape cover for snakes.

Below we further summarize project effects in terms of the PCEs of proposed gartersnake critical habitat within the construction footprint:

**PCEs 1-2 (Aquatic and Riparian Habitat, Adequate Terrestrial Space)**

Project activities would significantly alter PCEs 1 and 2. The river's main channel will be diverted into over 1,500 ft of bypass channels that will lack any structural characteristics of gartersnake critical habitat (streamside vegetation, wood and rock piles, and other escape cover). The pools and backwaters under both bridges would be temporarily lost, and heavy equipment

operations would temporarily eliminate the braided river channels as they currently exist. Rock and cobble substrates in the floodplain would be excavated for access, staging, and stockpiling.

**PCEs 3-4 (Native Prey Base, Absence of Nonnative Species)**

PCEs 3 and 4 are currently severely deficient throughout the main stem of the Verde River, from its headwaters to Horseshoe Reservoir; thus, the project would have limited effects to these PCEs. Native fish are not likely to be captured and relocated in large numbers. Euthanasia of nonnative fish would reduce prey temporarily. However, nonnative species are abundant in the Verde River and a short-term reduction in their numbers is not likely to significantly affect this gartersnake.

Narrow-headed Gartersnake Proposed Critical Habitat

The narrow-headed gartersnake is unlikely to occur in the construction footprint (see Appendix A). Its proposed critical habitat within the footprint is the same as the northern Mexican gartersnake. The PCE's for both species are essentially the same; thus, our analysis for proposed critical habitat for the narrow-headed gartersnake is the same as that of the northern Mexican gartersnake in the previous section.

Razorback Sucker and Spikedace and their Designated Critical Habitats

Effects to the razorback sucker and spikedace may result from capture and relocation efforts in the work area. Fish would be captured and relocated before and during dewatering, but fish removal would not be expected to be 100 percent successful. Some fish could be killed as dewatering occurs, and there is the potential for fish to be stressed, injured, or to die while they are being temporarily held and released. Some fish may die after release.

Effects to the sucker and spikedace and their critical habitats could also result from changes in water quality during the project. Project activities could cause accidental movement of chemicals, oils, construction materials, and debris into the river, any of which could cause fatalities or result in impairment of individual fish. Project effects would also include increased erosion and sedimentation within and downstream of the construction footprint. Erosion and turbidity would increase as a result of surface disturbances, especially bypass channel excavation and streambank destabilization resulting from vegetation removal. Increased turbidity may result in substrate embeddedness and lowered reproductive potential for both species.

Increased sedimentation and turbidity would be reduced to the extent possible by conservation commitments and BMPs, and effects would be temporary and would be no worse than what occurs naturally during periodic flooding.

**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. 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.

Within the action area, I-17 crosses privately-owned lands and public lands under BLM and USFS jurisdiction. ADOT holds an easement through BLM and USFS lands and owns the ROW adjacent to privately-owned land to maintain and operate the interstate. No new ROWs or easements are anticipated within the action area.

Within the construction footprint, lands are owned or administered by SRP, the Town of Camp Verde, and private individuals. Land uses on private lands include residential, commercial, light industrial, and agricultural developments. Within the Verde River floodplain (in the ROW), recreation is the primary land use. Given that one new access road that would be built for the project would be closed and restored to its original condition, the project would not be expected to increase recreational use within the floodplain above current levels. However, long term impacts that are unrelated to the project that could be expected to increase include all aspects of increased urbanization and development in the action area and construction footprint: increased recreation and trash deposition, habitat fragmentation, fire risk, spread of invasive species, and contamination of surface and groundwater. In addition, increased urbanization and development is likely to increase use of both surface and groundwater in the Verde River drainage and reduce flows in the Verde River.

## CONCLUSIONS

The conclusions of our biological and conference opinions 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.

After reviewing the current status of designated flycatcher critical habitat, proposed cuckoo critical habitat, the northern Mexican gartersnake and its proposed critical habitat, narrow-headed gartersnake proposed critical habitat, the razorback sucker and its designated critical habitat, and spikedace and its designated critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological and conference opinion that the proposed action is not likely to jeopardize the continued existence of any of the above species, or destroy or adversely modify their designated or proposed critical habitats. We base these conclusions on the following reasons:

<u>Southwestern Flycatcher Designated Critical Habitat</u>
<u>Yellow-billed Cuckoo Proposed Critical Habitat</u>

- Flycatcher: Although we anticipate temporary effects to PCEs 1 and 2 (riparian vegetation and insect prey populations) within the 6.2-ac construction footprint, this represents a very small proportion of the 208,973 ac of designated critical habitat for the flycatcher rangewide, and the 9.5-mi-long Upper Verde River Management Unit. Thus, designated critical habitat will remain functional for conservation and recovery of the flycatcher.
- Cuckoo: Although we anticipate temporary effects to PCEs 1 and 2 (riparian woodlands and adequate prey base), and PCE 3 (dynamic riverine processes) within about 3.0 ac of the 6.2- ac construction footprint, this represents a very small proportion of the 546,335 ac of proposed critical habitat for the cuckoo rangewide, and the 2,053-ac Lower

Verde/West Clear Creek Critical Habitat Unit. Thus, proposed critical habitat will remain functional for conservation and recovery of the cuckoo.

- Vegetation lost as a result of the project will be restored over the long term through re-vegetation and tree planting that will occur after completion of the project.
- Re-vegetation efforts may improve habitat for flycatchers and cuckoos by creating subcanopy layers within riparian gallery forests adjacent to the river's low-flow channel and by increasing vegetation density in disturbed areas on the floodplain.
- The project would not involve removal of vegetation within the majority of the CVRP, in particular, the 85 ac of mature, multi-layered cottonwood/willow gallery forest that currently supports breeding flycatchers and cuckoos.

Northern Mexican Gartersnake and Proposed Critical Habitat

- Implementation of conservation measures and BMPs, including biological monitors to move individual snakes from harm's way during construction, use of appropriate sediment control products, and measures to reduce effects to water quality, would help to reduce the potential for injury and fatality to gartersnakes that are present in the construction footprint when construction occurs.
- The core of the northern Mexican gartersnake population in the action area is in the mature cottonwood/willow gallery forest in the CVRP which is downstream and outside of the construction footprint. The CVRP is not expected to be appreciably affected by the proposed action.
- Although we anticipate temporary effects to PCEs 1 and 2 (aquatic or riparian habitat, adequate terrestrial space) within the 6.2-ac construction footprint, this represents a very small proportion of the 421,423 ac of proposed critical habitat for the northern Mexican gartersnake rangewide, and the 20,526-ac Upper Verde River Subbasin Critical Habitat Unit (which includes 139.8 stream mi, i.e., most of the mainstem of the Verde River). PCEs 1 and 2 would remain functional for conservation and recovery of this gartersnake.
- We expect minimal effects to PCEs 3 and 4 (native prey base and absence of nonnative species) as a result of the project. These gartersnakes are currently relying primarily on abundant nonnative prey. Removing and euthanizing nonnative species during fish relocation efforts would not be expected to have significant long-term effects.
- Re-vegetation efforts after completion of the project may improve snake habitat within the construction footprint.
- Both the northbound and southbound bridges have rail banks (boulders contained by heavy wire mesh) below their abutments. The rail banks will not be affected by project activities and will provide valuable cover for snakes during and after construction.

Proposed Critical Habitat for the Narrow-headed Gartersnake

- Although we anticipate temporary effects to PCEs 1 and 2 (stream habitat, adequate terrestrial space) within the 6.2-ac project footprint, this represents a very small proportion of the 210,189 ac of proposed critical habitat for the narrow-headed gartersnake rangewide, and the 18,721-ac Verde River Critical Habitat Subunit (which includes 127.5 stream mi). Thus, these PCEs of proposed critical habitat would remain functional for conservation and recovery of this gartersnake.

- We expect minimal effects to PCEs 3 and 4 (native prey base and absence of nonnative species) as a result of the project.

Razorback Sucker and Spikedace and Designated Critical Habitats

- The primary limiting factor for the razorback sucker and spikedace in the Verde River is the presence of nonnative fish and other nonnative species. The project would have minimal effects on the presence of nonnative species; thus, would have minimal effects on the presence of the sucker and spikedace.
- Although razorback suckers may occur in the construction footprint, the fish capture and relocation protocol included in the proposed action would minimize the risk of harming individual razorbacks that would be present during construction.
- Although spikedace are not expected to occur in the construction footprint, the capture and relocation protocol included in the proposed action would minimize the risk of harming individual spikedace that may be present during construction.
- Although construction effects to physical PCEs—river channel morphology, flow regimes, and water quality—would occur during construction, these effects would be temporary and habitat values would return to pre-construction conditions soon after project completion. BMPs and conservation measures would reduce effects to physical PCEs (e.g., effects of sedimentation) and critical habitats would remain functional to serve their conservation role for both species.

## 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 FR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 FR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Southwestern Willow Flycatcher, Western Yellow-billed Cuckoo, Narrow-headed Gartersnake

In our effects analysis above, we considered effects to designated and proposed critical habitats for the flycatcher, cuckoo, and narrow-headed gartersnake. Section 9 of the Act does not apply to critical habitats. Please see Appendix A for our concurrences on effects of this project on the above three species.

**AMOUNT OR EXTENT OF TAKE**

Northern Mexican Gartersnake

We anticipate that the proposed action is reasonably certain to result in incidental take of northern Mexican gartersnakes. Incidental take is expected to be in the forms of harm (direct injury or fatality) and harassment resulting from capture and relocation efforts, heavy equipment operations (e.g., crushing), and other project activities. Proposed capture and relocation of snakes will harass all individuals captured and may result in harm of a portion of those snakes, either during capture, while they are held, or after release. Snakes that die after release, due to the stress of handling or predation of weakened individuals, are unlikely to be detected because they will be released outside of the construction footprint. We cannot quantify the amount of take after snakes are released; however, we place no limit on the number of gartersnakes that are captured and harassed but show no signs of injury or obvious impairment at the time of release.

Snakes that are injured or otherwise impaired, or that die in the process of being captured and held, that cannot be released, can be quantified. We will consider take of snakes captured during the project to be exceeded if more than five individuals cannot be released.

Incidental take of snakes that are not captured, held, or relocated will occur if they are crushed in their dens or retreats or if they are killed or injured by heavy equipment while on the surface. Snakes killed on the surface may be detected. Those killed belowground are not likely to be detected. In both cases, it is difficult to estimate the numbers involved. Emmons and Nowak (2016) reported the capture of over 100 northern Mexican gartersnakes in the CVRP during their three-year study—over 60 percent of all snakes captured in the upper Verde River drainage during that study. Using the baseline of 100 snakes that have been documented within one mile of the Verde River bridges, and taking into account that some snakes that are killed or injured will not be detected, we will consider take to be exceeded if more than 15 individual gartersnakes (15 percent) are found injured or dead during the project.

Razorback Sucker

We anticipate that the proposed action is reasonably certain to result in incidental take of the razorback sucker. The proposed capture and relocation of razorbacks will harass all individuals involved and may result in harm (injury or fatality) of a portion of those fish, either during capture or while they are held before release. Fish may also die after release due to the stress from handling or predation of weakened individuals. We also anticipate take in the form of injury or death of all razorbacks that are not captured (i.e., are missed) during re-channeling of the river within the work area.

The actual number of razorbacks taken as a result of capture and relocation is difficult to predict. We authorize incidental take of an unlimited number of these fish in the form of short-term harassment as they are captured and moved to safety outside of the construction footprint.

It is also difficult to predict the number of razorbacks that will not be captured and relocated, or that will be impaired and may die as a result of capture and release. We expect that razorbacks will occur in the construction footprint in small numbers and anticipate take of up to two razorback suckers in the form of direct fatality or injury as a result of the proposed action.

Spikedace

We do not anticipate that implementation of the proposed action is reasonably certain to result in incidental take of any spikedace because:

- In spite of multiple spikedace surveys upstream of the Verde River bridges since 2005, and fish sampling that occurred downstream within one mi of the bridges (Emmons and Nowak 2016), no spikedace captures or detections have occurred on the mainstem of the Verde River since 1999.
- The nearest documented occurrences of spikedace are from Fossil Creek, more than 30 mi downstream of the construction footprint.

**EEFECT OF THE TAKE**

Northern Mexican Gartersnake

In this biological opinion, we determine that the level of anticipated take as described above is not likely to result in jeopardy to the species or destruction or adverse modification of proposed critical habitat. Although the proposed action is likely to adversely affect the gartersnake through harassment of individuals during capture and relocation, and fatalities of individuals that cannot be captured, the proposed action would not result in the permanent loss of the gartersnake in the action area.

Razorback Sucker

In this biological opinion, we determine that the level of anticipated take as described above is not likely to result in jeopardy to the species or destruction or adverse modification of proposed critical habitat. Although the proposed action is likely to adversely affect the razorback sucker through harassment of individuals during capture and relocation, and fatalities of individuals that cannot be captured, the proposed action would not result in the permanent loss of the razorback sucker in the action area.

**REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS**

The conservation measures included in the proposed action are appropriate to minimize take of the gartersnake and razorback sucker. However, we are including monitoring and reporting requirements as a reasonable and prudent measure to document any take that occurs. In order to be exempt from the prohibitions of section 9 of the Act, the FHWA/ADOT must comply with the

following terms and conditions which implement reasonable and prudent measure and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

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

    a) ADOT will designate a responsible party to monitor areas that could be affected by the proposed action to ascertain take of individual gartersnakes and razorback suckers. This monitoring will be accomplished by the biological monitors designated to implement the gartersnake monitoring and relocation protocol and fish relocation protocol as already prescribed.

    b) ADOT shall submit a monitoring report to the Arizona Ecological Services Field Office within 90 days after completion of the project. This report will briefly document implementation of conservation measures, the number of northern Mexican gartersnakes and razorback suckers encountered, including those captured and relocated, and gartersnake and razorback injuries and fatalities that occurred.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species, initial notification must be made to the U.S. Fish and Wildlife Service, Office of Law Enforcement, (Resident Agent in Charge), 4901 Paseo del Norte NE, Suite D, Albuquerque, New Mexico, 87113, telephone: 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 Office of Law Enforcement, with a copy to this office. Care must be taken in handling sick or injured animals, to ensure effective treatment and care, and 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.

We have not identified any additional conservation recommendations for the proposed action.

## REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in your consultation request. As provided in 50 FR 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.

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) 889-5950 or Brenda Smith at (928) 556-2157. In all future correspondence on this project, please refer to consultation number 02EAAZ00-2016-F-0244.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: (electronic)

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## APPENDIX A: CONCURRENCES

This appendix contains our concurrences with your "may affect, not likely to adversely affect" determinations for the endangered southwestern willow flycatcher, threatened western yellow-billed cuckoo, and threatened narrow-headed gartersnake.

## DESCRIPTION OF THE PROPOSED ACTION

The proposed action is described above in our Biological/Conference Opinion. The BO/CO is incorporated herein by reference. The proposed action is to complete scour retrofits on all 12 piers of the northbound and southbound I-17 bridges over the Verde River in Yavapai County, Arizona.

Southwestern Willow Flycatcher

No surveys for the flycatcher were conducted specifically for this project, but protocol surveys (Sogge et al. 2010) have been conducted every two years by the Salt River Project (SRP) as part of the Roosevelt Habitat Conservation Plan monitoring program that includes the 124-ac Camp Verde Riparian Preserve (CVRP), located east and southeast of the northbound I-17 bridge. In 2012, three flycatcher territories were detected (SRP 2012). In 2014, seven territories were detected and one nest was confirmed (SRP 2014). In 2016, six territories, and four pairs were detected, but no nests were found. All confirmed territories, pairs, and the one nest were in the southeastern part of the CRVP outside the construction footprint, from 0.5 to 0.75 mi from the Verde River bridges. As we described above in the BO/CO, the construction footprint lacks the dense, complex, riparian vegetation that provides suitable flycatcher breeding habitat; however, mature gallery forests and shrub willows adjacent to the river within the construction footprint could be used for foraging by birds from the CVRP and as migration stopover habitat.

### Conservation Measures

- ADOT would arrange for preconstruction environmental awareness training for all personnel working at the bridges, including, but not limited to, contractors, contractors' employees, supervisors, inspectors, and subcontractors. Training would include information on the biology and distribution of the southwestern willow flycatcher, its legal status, measures to avoid impacts, and procedures to be implemented in case of encounters.

- All vegetation clearing would occur from October 1 to February 28 which is outside the flycatcher's migration and breeding period (April 15-September 30).

DETERMINATION OF EFFECTS

We concur with your determination that the proposed action "may affect, but is not likely to adversely affect" the southwestern willow flycatcher for the following reasons:

- Based on the lack of suitable nesting habitat, it is unlikely that breeding flycatchers occur in the construction footprint; therefore, any direct effects (injuries or fatalities to adults, eggs, or young) are discountable.

- Although foraging or migrant flycatchers may occur in the construction footprint during the geotechnical investigation, there is ample foraging and sheltering habitat available to flycatchers in the CVRP; therefore, any effects of these activities would be insignificant.

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Western Yellow-billed Cuckoo

Surveys for cuckoos were not done specifically for this project but call-playback protocol surveys (Halterman et. al. 2015) were done in 2012, 2014, and 2016 within the CVRP (SRP 2012, 2014, 2016). Ten detections of cuckoos occurred in 2012, five in 2014, and 20 in 2016.

Halterman et al. (2015) provided guidance on interpreting call playback data. Clusters of call playback detections in July, or detections of birds at the same location during at least two survey periods, suggest that breeders are present in an area. Most birds detected in July are assumed to be breeders because most migrants have left the area by then. A probable breeding pair is reported if birds are detected during three of the four required surveys.

All 20 detections that occurred during protocol surveys in 2016 were from two general areas of the CVRP. A relatively tight cluster of 13 detections occurred in the central part of the CVRP. This cluster included detections during all four of the protocol surveys, eight of which occurred in July. Seven detections, more loosely distributed, occurred in the southeastern part of the CVRP. Detections in this area also occurred during each of the four protocol surveys in 2016, including three detections in July. Thus, survey data suggest that two cuckoo pairs bred in the CVRP in 2016. All but one of the detections in 2016 occurred outside of the construction footprint; however, two detections, both on July 8, 2016, occurred within 0.1 mi of the construction footprint.

Riparian vegetation within the construction footprint does not meet the extent of habitat for nesting and foraging as currently defined in the critical habitat proposed rule (see page 10 above); however, mature cottonwoods and willow adjacent to the river within the construction

footprint could be used for foraging by birds nesting in the CVRP, as migration stopover habitat, and possibly for nesting.

**Conservation Measures**

- ADOT would arrange for preconstruction environmental awareness training for all personnel working at the bridges, including, but not limited to, contractors, contractors' employees, supervisors, inspectors, and subcontractors. Training would include information on the biology and distribution of the western yellow-billed cuckoo, its legal status, measures to avoid impacts, and procedures to be implemented in case of encounters;

- All vegetation clearing would occur from October 1 to February 28, which is outside the cuckoo's migration and breeding period (May 15-September 30).

DETERMINATION OF EFFECTS

We concur with your determination that the proposed action "may affect, but is not likely to adversely affect" the western yellow-billed cuckoo for the following reasons:

- Given that vegetation clearing would not occur during the cuckoo's breeding period, any direct effects (injuries or fatalities to adults, eggs, or young) are discountable.

- Although foraging or migrant cuckoos may occur in the construction footprint during the geotechnical investigation, there is ample foraging and sheltering habitat available to cuckoos in the CVRP; therefore, any effects to these activities resulting from the proposed action would be insignificant.

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Narrow-headed Gartersnake

No formal surveys for this species were done for the purposes of this project. Narrow-headed gartersnakes have been documented on the Verde River in small numbers since at least 2001, but no records have occurred near the construction footprint. An early vouchered record was from 2001 at Mormon Pocket, between Perkinsville and the confluence with Sycamore Creek, over 25 mi upstream of the Verde River bridges (Holycross et al. 2006). In 2005, an adult was caught by a dip net near the confluence of Fossil Creek, over 30 mi downstream of the bridges (Hanna 2005, Holycross et al. 2006). Emmons et al. (2011) reported a possible adult and one neonate near Prospect Point in 2010, on the Prescott National Forest, about 30 mi upstream of the bridges. Two additional snakes were reported at Prospect Point in 2012 (personal communication from I. Emmons, Northern Arizona University, to J. Servoss, U.S. Fish and Wildlife Service, undated memo). Emmons and Nowak (2016) did not capture or observe narrow-headed gartersnakes during surveys at seven sites that occurred on the upper Verde River from 2012 to 2015. The southernmost survey site was within one mi of the Verde River bridges—in the CVRP—where over 100 northern Mexican gartersnakes (but no narrow-headed gartersnakes) were reported.

**Conservation Measures**

- ADOT would arrange for preconstruction environmental awareness training for all personnel working at the bridges, including, but not limited to, contractors, contractors' employees, supervisors, inspectors, and subcontractors. Training would include information on the narrow-headed gartersnake, its biology and distribution, legal status, measures to avoid impacts, and procedures to be implemented in case of encounters.
- Erosion control products using mesh or netting with an opening one-quarter inch wide or greater, which could cause entanglement with gartersnakes, would not be permitted as part of the containment plan for sediment and erosion control described above in the BO/CO.

DETERMINATION OF EFFECTS

We concur with your determination that the proposed action "may affect, but is not likely to adversely affect" the narrow-headed gartersnake for the following reasons:

- Based on the lack of records of the narrow-headed gartersnake within 25 mi of the construction footprint, and the fact that the species occurs on the Verde River in small numbers, it is unlikely that this snake would be encountered during the proposed action.
- In the unlikely event of an encounter with this species during the project, the gartersnake relocation protocol described in the BO/CO for the northern Mexican gartersnake would also apply to the narrow-headed gartersnake and would help to reduce the risks to this species as well.

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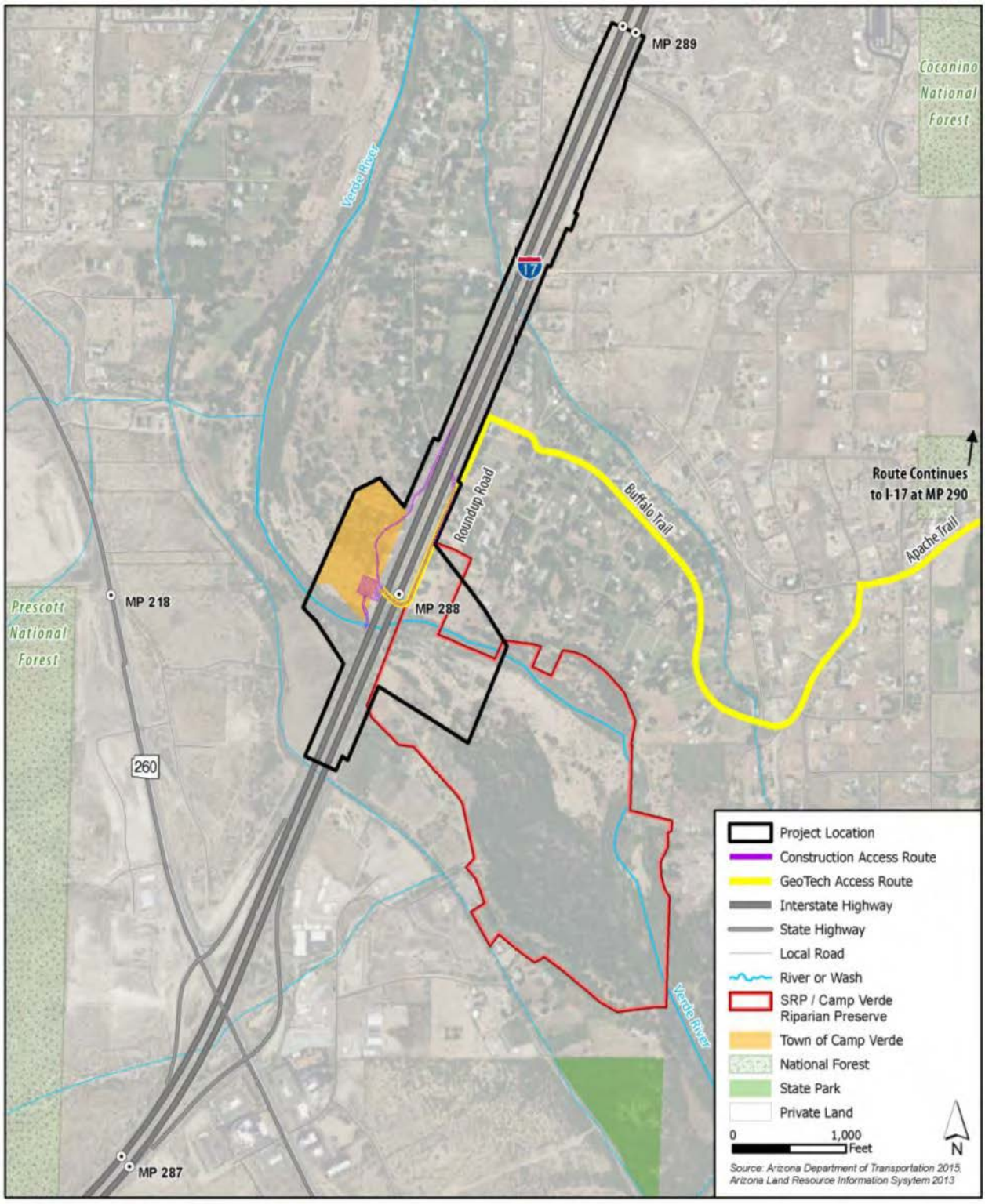


Figure 1. Vicinity map for the I-17 Verde River Bridge Project, including the Salt River Project's Camp Verde Riparian Preserve.

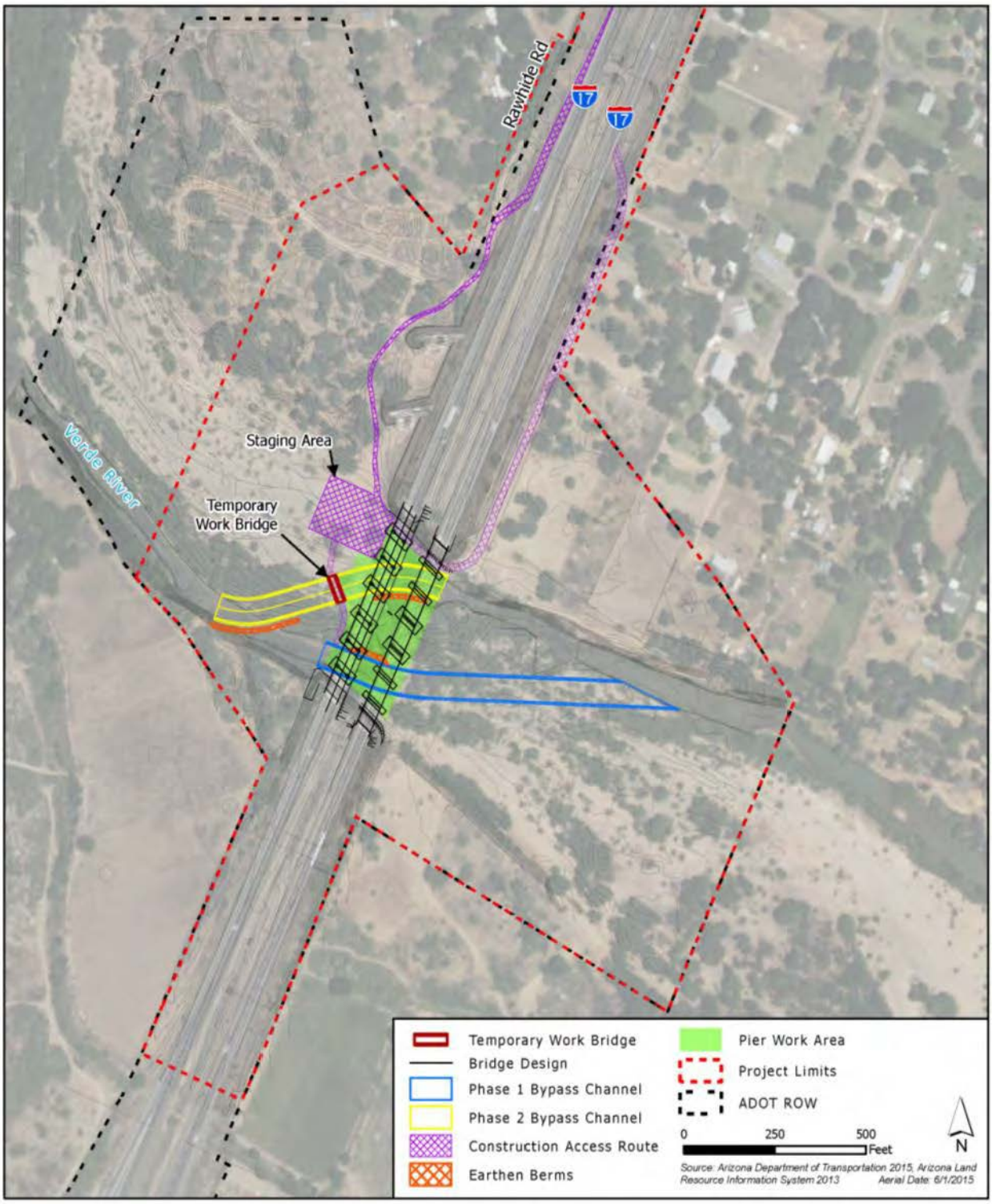


Figure 2. Access routes, staging area, temporary work bridge, dewatering channels, and pier locations for the I-17 Verde River Bridge Project.