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In reply refer to:
AESO/SE
02EAAZ00-2015-F-0030

February 8, 2016

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

RE: SR 92 San Pedro River Bridge Replacement Project
FHWA File # 092-A(203)T
ADOT File # 092 CH 340 H8323 01C

Dear Ms. Petty:

Thank you for your request for consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated December 7, 2015 and was received by us via electronic mail (email) on the same day. We received the biological evaluation (BE) for the proposed action, dated December 2015, on 2 December 2015. At issue are effects of a bridge replacement project on State Route (SR) 92, at the San Pedro River, approximately 18 miles (mi) southeast of the Town of Sierra Vista, Cochise County, Arizona. You concluded that the proposed action "may affect, and is likely to adversely affect" the threatened western yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo) and its proposed critical habitat, and proposed critical habitat for the threatened northern Mexican gartersnake (*Thamnophis eques megalops*) (gartersnake). We are providing a biological opinion of effects to the cuckoo and a conference opinion regarding effects to proposed critical habitat for the cuckoo and proposed critical habitat for the gartersnake.

You also concluded that the proposed action "may affect, but is not likely to adversely affect" the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher) and the gartersnake. We concur with your determinations and provide our rationales in Appendix A.

This biological and conference opinion is based on information provided in the December 2015 BE, email correspondence, telephone conversations, field investigations, and other sources of information found in the administrative record supporting this biological opinion. Literature

cited in this BO is not a complete bibliography of all literature available on the species of concern, bridge construction on streams or rivers and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office (file number 02EAAZ00-2015-F-0030).

Consultation History

October 8, 2015.	We received the draft BE for this project, dated October 2015, with a request for our review and comments.
October 14, 2015	We sent our comments on the draft BE.
December 2, 2015	We received the final BE for this project, dated December 2015.
December 7, 2015	We received your requests for formal consultation and conference.
January 25, 2016.	We sent you the draft BO/CO.

BIOLOGICAL AND CONFERENCE OPINIONS

DESCRIPTION OF THE PROPOSED ACTION

The following summary of the proposed action is taken from the BE. Maps, photographs, and diagrams of the action area are included in the BE and are incorporated herein by reference.

Throughout the BE, and in this BO/CO, the term "project limits" is used to represent the construction footprint (area of disturbance), while the term "project area" also includes surrounding lands outside but adjacent to the project limits. In the BE, the term "project vicinity" is used to denote a more expansive landscape context. However, in this BO/CO, we do not use the term "project vicinity." Instead we use the term "action area" in a similar context (see page 6 below).

The Federal Highway Administration (FHWA) and Arizona Department of Transportation (ADOT) are planning to replace the existing bridge that crosses the San Pedro River with a new bridge. The existing bridge has been determined to be structurally deficient and vulnerable to scour because of the generally poor condition of the superstructure. There are numerous narrow- to medium-sized cracks across the bridge's decks, and concrete on the decks is generally deteriorated. In addition, the bridge foundations are unstable for the calculated scour, and overall the bridge does not meet current design criteria. The purpose of the project is to address the structural and overall condition of the bridge by replacing it to meet current design criteria.

The San Pedro River Bridge Replacement Project will occur on SR 92 between milepost (MP) 339.2 and MP 341.1 eastbound, and between MP 340.1 and MP 342.0 westbound, within ADOT right-of-way (ROW). Within the project limits (defined above), SR 92 includes two 12.5-foot (ft)-wide travel lanes, one eastbound and one westbound, with 7.5- to 9.5-ft-wide paved shoulders. The existing structure spanning the San Pedro River, a 5-span bridge, 315 ft long and 40 ft wide, was constructed in 1955. The new bridge would be 362 ft long and 44 ft wide

constructed in two phases to maintain one lane of traffic during construction. The project scope will include:

- Placing roadwork notification signage along various locations on SR 90, SR 92, and SR 80;
- Clearing and grubbing within the ROW to allow construction and equipment room to maneuver;
- Building temporary construction access roads on each side of the bridge; a rail car bridge will be used to span the San Pedro River low-flow channel; an ephemeral tributary channel will have multiple pipe culverts constructed along its existing alignment to temporarily carry storm flows into the San Pedro River channel within the ROW beneath the area that will be used for construction operations;
- Removing three private driveways that directly access SR 92 near the northwest end of the bridge and providing a single access from SR 92 along a new road in ADOT ROW that will allow access to four adjacent properties during construction;
- Placing a temporary concrete barrier on the bridge and traffic signals on the bridge approaches to control traffic with one traffic lane;
- Temporarily diverting flows within a portion of the San Pedro River low flow channel around a concrete pier wall partially within the river low flow channel, to permanently remove it;
- Removing the south half of the existing bridge, including the deck, railing/curb, three steel girders, portions of five pier walls, portions of the abutments, and upper portions of the wing wall and back wall;
- Reconstructing the new substructure abutments and two new piers outside the San Pedro low flow channel, supported by two 4.5-ft-diameter columns on 8-ft-diameter drilled shafts;
- Erecting three new concrete girders;
- Constructing a new concrete deck, expansion joints, and concrete barrier;
- Moving temporary concrete barrier and shifting traffic to the newly constructed bridge;
- Removing the remaining north half of the existing bridge, including the deck, railing, and curb, U.S. Geological Survey gauging station, three steel girders, five pier walls, portions of the abutments, and upper portions of the wing wall and back wall;
- Reconstructing the new substructure abutments and two new piers outside the San Pedro low flow channel, supported by two 4.5-ft -diameter columns on 8-ft-diameter drilled shafts;
- Erecting four new concrete girders;
- Constructing the remaining portions of new concrete deck, expansion joints, and concrete barrier;
- Constructing new retention basins on both sides of the roadway near each end of the bridge;
- Implementing a re-vegetation plan that includes seeding disturbed areas with species native to the project area and replacing lost trees;
- Striping the bridge deck and opening bridge to full traffic.

Thus, prior to removal of one of the original bridge piers that is currently in the river channel, access roads to allow movement of heavy equipment onto the floodplain would be constructed along with staging and work areas. Staging and work areas would also provide platforms for

constructing abutments for railcar bridges, for pier shaft drilling for new piers, and for new pier construction. Construction of access roads, staging areas, and work areas will also involve tree removal (as described below) and grading and contouring of the floodplain and riverbanks to establish stable work platforms. Establishing work platforms will also require placement of temporary pipe culverts in an ephemeral wash, which enters the project limits from the northeast, and covering the culverts with earthen material.

To remove the existing bridge pier from the river channel, a coffer dam, berm of native channel material, or diversion structure such as a temporary concrete barrier, will be placed in the river to push flows around the pier for up to two weeks so that equipment can access and remove the concrete pier. After the pier is removed the barrier will be removed and flows will resume unimpeded below the bridge. Construction activities will affect approximately 0.76 ac of the floodplain. Incidental damage to vegetation will occur outside these areas due to foot access and transient work or laydown areas that would not be cleared of trees.

Construction activities will also involve removal of existing pier walls, removal of three driveway access points and the construction of a new access road off SR 92. A majority of the ROW within the project limits will be affected by ground disturbance; however, these disturbances will mostly be temporary. One pier wall that will be removed is partially within the San Pedro River low flow channel. Removal of this pier wall and the existing pier that is in the channel will improve flows within the San Pedro River.

The primary and most serious effect of the project will be the removal of 58 trees from the floodplain, including 31 Freemont cottonwoods (*Populus fremontii*), 17 Gooding's willows (*Salix gooddingii*), 8 velvet mesquites (*Prosobis velutina*), and 2 Arizona walnuts (*Juglans major*). Diameter-at-breast-height (dbh) of these trees ranges from 4-60 in, and averages 33.6 in. An additional 3 Freemont cottonwoods would be trimmed.

From February 19, 2013 to July 8, 2015, field visits to the project area were conducted to address constructability and issues related to tree removal within the San Pedro River riparian corridor, with the intent of protecting as many cottonwood and willow trees as possible. Where possible, trees were considered for trimming rather than removal. Approximately 100 trees were avoided intentionally during project planning, including 70 Freemont cottonwood, 10 Gooding's willow, 12 velvet mesquite, 4 seep willow (*Baccharis sarathroides*), and 2 each of Arizona walnut and Arizona ash (*Fraxinus velutina*). Although an extensive attempt will be made to retain these trees, specific construction circumstances and equipment maneuvering may require unplanned tree trimming and possible removal of additional trees. FHWA will not be responsible for vegetation maintenance activities after bridge construction has been completed, but additional tree trimming and removal of trees by ADOT could occur after construction if trees or tree limbs obscure visibility for motorists on the bridge or on the bridge approaches, or if vegetation threatens to undermine the bridge's structural integrity.

Construction is anticipated to begin in September 2016 and is expected to take approximately 11 months to complete.

Conservation Measures

Conservation measures are those defined on page 29 of the BE as "Mitigation Measures." Mitigation measures are further broken down into the following categories: design responsibilities, contractor responsibilities, roadside development section (RDS) responsibilities, ADOT Southeast District responsibilities, and ADOT Environmental Planning Group (EPG) Responsibilities. Those that are relevant to this BO/CO are as follows:

Design and Contractor Responsibilities

- Fencing and flagging will be used to identify trees and areas of the floodplain to be avoided during construction. Within ten working days prior to construction, the contractor shall contact the EPG to arrange for a qualified biologist to be present during initial tree removal and to stake and flag avoidance areas.
- The contractor shall avoid all flagged and/or otherwise designated sensitive resource areas within or adjacent to the project area.
- A vegetation planting and habitat improvement plan will be developed featuring plant species native to the project vicinity to replace vegetation removed within the San Pedro River riparian zone and within ADOT's ROW. ADOT's re-vegetation plan will include planting of pole-planted and tall-potted cottonwoods and willows that are native to the area. The tall-potted plants will include drip irrigation for the first two years after planting. During the first 12 months after re-vegetation, failing plants will be replaced and maintained for a minimum of 12 more months. ADOT will monitor the results of re-vegetation efforts within the project limits quarterly each year for two years and summarize the results of those efforts in a report to the FWS two years after re-vegetation efforts occurred.
- Standard specifications will be implemented in accordance with the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 104.09, (2008 Edition), "Prevention of Landscape Defacement; Protection of Streams, Lakes and Reservoirs." This will require the contractor to prevent pollutants such as fuels, oil, bitumens, calcium chloride, fresh Portland cement, fresh Portland cement concrete, raw sewage, muddy water, chemicals or other harmful materials from entering the San Pedro River. The specification will require temporary and permanent erosion control and pollution prevention measures to be submitted to the ADOT Engineer for approval prior to any ground clearing to ensure protection of the San Pedro River.
- No erosion control products containing mesh or netting with an opening 1/4 inch or greater will be used within 600 feet of the San Pedro River to protect the northern Mexican gartersnake (gartersnakes can become entangled in larger mesh sizes).
- Construction equipment and vehicles shall not enter the San Pedro River wetted channel except for the removal of the existing pier within the San Pedro River low flow channel. Construction access for pier removal shall occur from the west bank of the San Pedro River and the activity to remove the pier shall occur only on the west bank and portion of the low flow channel where the pier is located. Equipment and vehicles shall not cross the San Pedro River.
- All construction and demolition activity occurring in the floodplain of the San Pedro River, with the exception of the removal of the pier in the San Pedro River low flow channel, shall cease if work areas become inundated or saturated with water.

- The contractor shall not pump water from the San Pedro River for any reason.
- The contractor shall develop and implement a Spill Prevention and Containment Measures Plan for working over and adjacent to the San Pedro River. The containment plan shall be approved by the Engineer and EPG prior to construction. The spill/containment plan shall state that the contractor will notify the EPG immediately after any spills. In the event of a breech in containment, the contractor shall cease all construction until the spill is addressed and further spills are prevented. The contractor shall notify the EPG to evaluate impacts to habitat and determine if agency notification is required.
- Prior to the start of ground-disturbing activities, the contractor shall prepare a Noxious and Invasive Plant Species Treatment and Control Plan and arrange for and perform the control of noxious and invasive species in the project area.
- To prevent the introduction of invasive plants into the project area, the contractor shall inspect all earthmoving and hauling equipment at the contractor's equipment storage facility, and the equipment shall be washed prior to entering the construction site.
- To prevent invasive species from leaving the construction site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

RDS Responsibilities

- RDS will provide special provisions for the control of noxious and invasive plant species during construction that may require treatment and control within the project limits. RDS will review and approve or reject the Noxious and Invasive Plant Species Treatment and Control Plan prepared by the contractor, and to be submitted to the Engineer as required in the specifications, within ten working days of receipt. Once approved, RDS will return the plan to the Engineer.

Southeast District Responsibilities

- The Engineer will contact EPG to assure that an EPG representative attends any and all preconstruction meetings.
- If clearing, grubbing, or tree/limb removal will take place during the bird breeding period (March 1 to August 31), the Engineer will contact EPG ten working days prior to clearing, grubbing, or tree/limb removal to arrange for a qualified biologist to conduct nest surveys of vegetation 48 hours prior to removal.
- During the non-breeding season (September 1 to February 28) clearing, grubbing, or tree/limb removal may proceed without restriction.
- If it is determined during construction, after initial tree removal and trimming, that additional trees need to be removed or trimmed, the contractor shall immediately contact the Engineer prior to any tree cutting. The Engineer will contact EPG who will then evaluate the impacts and contact FWS for guidance.

EPG Responsibilities

- Within ten working days prior to construction, the EPG will hire a qualified biological monitor to be present during initial tree removal and to stake and flag avoidance areas.

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 CFR § 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment, focusing on, but not exclusive to, the SR 92 bridge over the San Pedro River in Cochise County, Arizona.

STATUS OF THE SPECIES AND PROPOSED CRITICAL HABITAT

Western Yellow-billed Cuckoo

The western yellow-billed cuckoo was listed as threatened under the Act on October 3, 2014 (79 FR 59992). Critical habitat for the cuckoo was proposed on August 15, 2014 (79 FR 48548).

The yellow-billed cuckoo is a Neotropical migrant that winters in South America and breeds in North America. Cuckoos throughout the western continental United States and Mexico are generally larger than their eastern counterparts, with significantly longer wings, longer tails, and longer and deeper bills (Franzreb and Laymon 1993). Birds with these characteristics occupy the Western Distinct Population Segment (DPS) and we refer to them as the "western yellow-billed cuckoo." Only the Western DPS was listed as threatened in 2014. Cuckoos in the west arrive on their breeding grounds 4 to 8 weeks later than eastern yellow-billed cuckoos at similar latitudes (Franzreb and Laymon 1993, Hughes 1999).

Cuckoos in the DPS were formerly widespread and locally common in California and Arizona, more narrowly distributed but locally common in New Mexico, Oregon, and Washington and uncommon along the western front of the Rocky Mountains north to British Columbia (American Ornithologists' Union 1998, Hughes 1999). The species may be extirpated from British Colombia, Washington, and Oregon (Hughes 1999). The cuckoo is now very rare in scattered drainages in western Colorado, Idaho, Nevada, and Utah, with single, nonbreeding birds most likely to occur (79 FR 48548, 79 FR 59992). The largest remaining breeding areas are in southern and central California, Arizona, along the Rio Grande in New Mexico, and in northwestern Mexico (79 FR 59992).

In Arizona, the species was a common resident in the (chiefly lower) Sonoran zones of southern, central, and western Arizona; scarce in the north-central part of the state; and very rare in the northeast (Phillips et al. 1964). In Arizona, the cuckoo now nests primarily in the central and southern parts of the state.

Western populations of the cuckoo are most commonly found in dense woodlands, consisting primarily of cottonwood (*P. fremontii*), willow (*Salix* spp.), and mesquite (*Prosopis* spp.) along riparian corridors in otherwise arid areas (Laymon and Halterman 1989, Hughes 1999). Occupied riparian habitat in Arizona may also contain box elder (*Acer negundo*), Arizona alder (*Alnus oblongifolia*), Arizona walnut, Arizona sycamore (*Platanus wrightii*), oak (*Quercus* spp.), netleaf hackberry (*Celtis reticulata*), velvet ash (*Fraxinus velutina*), Mexican elderberry (*Sambuccus mexicanus*), tamarisk (*Tamarix* spp.; also called salt cedar), acacia (*Acacia* spp.),

and seepwillow (Corman and Magill 2000, Corman and Wise-Gervais 2005, USFWS unpubl. data). Tamarisk may be a component of breeding habitat, but there is usually a native riparian tree component within occupied habitats (Gaines and Laymon 1984, Johnson et al. 2008, McNeil et al. 2013, Carstensen et al. 2015). Although cuckoos are most commonly found in riparian gallery forests, in Arizona they may also use narrow bands of riparian woodland (Arizona Game and Fish Department [AGFD] 2015), Cornell Lab of Ornithology 2015). Adjacent habitat on terraces or in upland areas (such as mesquite) can enhance the value of these narrow bands of riparian woodland.

In most of its western range, the cuckoo breeds primarily along rivers and streams with slopes ≤3 percent, and in open riverine valleys that provide wide floodplain conditions (greater than 325 ft). However, in the Southwest cuckoos can also breed in higher gradient drainages, and in narrower and drier reaches of riparian habitat. Cuckoos in Arizona will also use areas of mesquite and oak woodlands some distance from riparian gallery forests. Recent surveys found yellow-billed cuckoos with some regularity in these non-traditional habitats (e.g., Corman and Magill 2000; Westland Resources, Inc. 2013a, 2013b, 2015a, 2015b, 2015c; Tucson Audubon 2015a, 2015b).

Throughout the West, the majority of nests are placed in willow trees, but cottonwood, mesquite, walnut, box elder, sycamore, hackberry, oak, alder, soapberry (*Sapindus saponaria*), acacia, and tamarisk are also used (Laymon 1980, Hughes 1999, Corman and Magill 2000, Corman and Wise-Gervais 2005, Holmes et al. 2008, Tucson Audubon 2015a, Tucson Audubon 2015b, USFWS unpubl. data).

Within the boundaries of the DPS, cuckoos occur from sea level to elevations up to 7,000 ft or more; however, the moist conditions that support riparian plant communities typically occur at lower elevations. In southeastern Arizona, however, cuckoos are also found nesting along more arid ephemeral and intermittent drainages with sycamore, mesquite, walnut, hackberry, alder, or mixed oak assemblages (Corman and Magill 2000; Corman and Wise-Gervais 2005;Westland Resources, Inc. 2013a, 2013b, 2013c, 2015a, 2015b, 2015c; American Birding Association 2014; AGFD 2015; Tucson Audubon 2015a, 2015b; Cornell Lab of Ornithology 2015).

Habitat for the cuckoo in much of its range is associated with perennial rivers and streams that support the expanse of vegetation characteristics needed for breeding. The range and variation of stream flow frequency, magnitude, duration, and timing that will establish and maintain riparian habitat can occur in different types of regulated and unregulated flows depending on the interaction of the water and the physical characteristics of the landscape (Poff et al. 1997; USFWS 2002). Hydrologic conditions at western yellow-billed cuckoo breeding sites can vary widely between years, and especially among years of low rainfall years. Water or saturated soil may not always be present in occupied cuckoo habitats. Cuckoos may move from one area to another within and between years in response to hydrological conditions. They may also nest at more than one location in a year. Some individuals roam widely (several hundred miles), apparently assessing food resources before selecting a nest site (Sechrist et al. 2012).

Humid conditions created by surface and subsurface moisture and a multi-layered canopy appear to be important habitat parameters for cuckoos. The species appears to be restricted during

nesting to drainages where humidity is adequate for successful hatching and rearing of young (Hamilton and Hamilton 1965, Gaines and Laymon 1984).

The association of breeding with large tracts of suitable riparian habitat is likely related to home range size. Individual home ranges during the breeding period average over 40 ha, and home ranges up to 202 ha have been recorded (Laymon and Halterman 1987, Halterman 2009, Sechrist et al. 2009, McNeil et al. 2011, McNeil et al. 2012). Within riparian habitat, cuckoos require relatively large patches of multilayered habitat for nesting (>20 hectares), with optimal size generally greater than 80 ha (Laymon and Halterman 1989).

In addition to dense, multi-layered woodlands, cuckoos need adequate foraging areas near the nest. Foraging areas can be less dense or patchy with lower levels of canopy cover and may include a mix of shrubs, ground cover, and scattered trees (Carstensen et al. 2015, Sechrist et al. 2009, USFWS, unpubl. data). Cuckoos often forage in open areas, woodlands, orchards and adjacent streams (Hughes 1999), which include stands of smaller mesquite trees and even tamarisk. In Arizona, adjacent habitat is usually more arid than occupied nesting habitat. Habitat types include Sonoran desertscrub, Mojave desertscrub, Chihuahuan desertscrub, chaparral, semidesert grassland, plains grassland, and Great Basin grasslands (Brown 1994, Brown et al. 2007, Brown and Lowe 1982).

Habitat needs during migration are not well understood, although they appear to include a relatively wide variety of conditions. Migrating cuckoos have been found in coastal scrub, second-growth forests and woodlands, hedgerows, forest edges, and in smaller riparian patches than those used for breeding.

In addition to gallery riparian forest and mesquite woodlands, cuckoos are also using more xeroriparian drainages in the foothills and mountains of southeastern Arizona. This kind of habitat is more typical of habitat where cuckoos are found in Sonora, Mexico.

The primary threat to the western yellow-billed cuckoo is loss or fragmentation of high-quality riparian habitat suitable for nesting (Corman and Wise-Gervais 2005, 79 FR 48548, 79 FR 59992). Factors leading to habitat loss and degradation include alteration of flows in rivers and streams, encroachment into suitable habitats due to agricultural and other developments, stream channelization and stabilization, diversion of surface and ground water for agricultural and municipal purposes, livestock grazing, wildfire, establishment of nonnative vegetation, drought, and prey scarcity due to pesticides (Ehrlich et al. 1992, 79 FR 59992). Pesticide use is widespread in agricultural areas in the U.S. and northern Mexico. Cuckoos have also been exposed to the effects of pesticides on their wintering grounds, as evidenced by DDT found in eggs and eggshell thinning in the U.S. (Grocki and Johnston 1974, Laymon and Halterman 1987, Hughes 1999, Cantu-Soto et al. 2011).

Ongoing threats to small isolated populations cause remaining populations to be increasingly susceptible to further declines and local extirpations through increased predation rates, barriers to dispersal, chance weather events, fluctuating availability of prey populations, collisions with tall vertical structures during migration, defoliation of tamarisk by the introduced tamarisk leaf beetle (*Diorhabda* spp.), increased fire risk, and climate change events (Thompson 1961, McGill

1975, Wilcove et al. 1986). The warmer temperatures already occurring in the southwestern United States may alter the plant species composition of riparian forests over time. An altered climate may also disrupt food availability for the western yellow-billed cuckoo if the timing of peak insect emergence changes in relation to when the cuckoos arrive on their breeding grounds to feed on this critical food source.

In summary, habitat for the western yellow-billed cuckoo has been modified and curtailed, resulting in the availability of only remnants of formerly large tracts of native riparian forests, many of which are no longer occupied by western yellow-billed cuckoos. Despite recent efforts to protect existing habitats, and to restore additional, riparian habitats in the Sacramento, Kern, and Colorado Rivers, and other rivers in the range of the western yellow-billed cuckoo, these efforts offset only a small fraction of historical habitat that has been lost. Therefore, we expect the threat resulting from the combined effects associated with small and widely separated habitat patches to continue to affect a large portion of the cuckoo's range.

Proposed Critical Habitat

FWS proposed designation of 546,335 acres of critical habitat for the western yellow-billed cuckoo in 80 units in California, Arizona, New Mexico, Colorado, Utah, Idaho, Nevada, Wyoming, and Texas on August 15, 2014 (79 FR 48548). FWS proposed the following primary constituent elements (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 acres (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

The *Federal Register* notice listing the northern Mexican gartersnake as threatened under the Act was published 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, which reaches up to 44 in total length, ranges in color from olive to olive-brown or olive-gray with three lighter-colored stripes that run the length of the body, the middle of which darkens towards the tail. It may occur with other native gartersnake species and can be difficult for people without specific expertise to identify because of its similarities to other native gartersnake species.

Throughout its range, this gartersnake occurs at elevations from 130 to 8,497 ft (Rossman et al. 1996) and 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 a mile away from any surface water (Cogan 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 during July and August, followed by June and 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). Its diet consists primarily of 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 (Holycross et al. 2006, Emmons and Nowak 2013), or other nonnative fishes. In gartersnake populations where the prey base is skewed heavily towards harmful nonnative species, recruitment of gartersnakes is often diminished or nearly absent.

Natural predators of this gartersnake may include birds of prey, other snakes, wading birds, mergansers, belted kingfishers, raccoons, skunks, and coyotes (Rosen and Schwalbe 1988, Brennan et al. 2009). Historically, large, highly predatory native fish species such as Colorado pikeminnow may have preyed upon northern Mexican gartersnakes where they co-occurred. Native chubs in their largest size class may also prey on neonatal gartersnakes, but this has not been confirmed in the literature or through field observation.

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, from several perennial or intermittent creeks, streams, and rivers as well as lentic wetlands such as cienegas, ponds, or 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). Within Mexico, northern Mexican gartersnakes historically occurred within the Sierra Madre Occidental and 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 United States where the subspecies remains reliably detected are all 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 occur in extremely low population densities, but limited survey efforts have been inconclusive to determine extirpation of this highly secretive species. The status of the northern Mexican gartersnake on tribal lands, such as those owned by the White Mountain or San Carlos Apache Tribes, is poorly understood. Less is known about the current distribution of the northern Mexican gartersnake in Mexico due to limited surveys and limited access to information on survey efforts and field data from Mexico.

We have concluded that in as many as 23 of 33 known localities in the United States (70 percent), northern Mexican gartersnake populations are likely not viable and may exist at low enough densities that populations are threatened with extirpation. The gartersnake may already be extirpated in many of these locations. Harmful nonnative species are a significant concern in almost every northern Mexican gartersnake locality in the United States and the most significant reason for their decline. We consider harmful nonnative species to include, but not be 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 contribute to starvation of gartersnake populations through competitive mechanisms, and may reduce or eliminate recruitment of young gartersnakes through predation. Other threats include alteration of rivers and streams from dams, diversions, flood-control projects, and groundwater pumping that change flow regimes, reduce or eliminate habitat, and favor harmful nonnative species; and effects from climate change and drought (79 FR 38678).

Proposed Critical Habitat

Critical habitat for the gartersnake has been proposed in 14 units in portions of Arizona and New Mexico totaling 421,423 ac. Within these areas, the primary constituent elements (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.

ENVIRONMENTAL BASELINE

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

Description of the Action Area

The San Pedro River is the last undammed desert river in the American Southwest. It flows south to north, from its headwaters in Mexico, to the Gila River >100 mi north of the SR 92 San Pedro River crossing. Flows in the San Pedro River are subject to depletion through groundwater pumping, water diversions, and other factors (Arizona Department of Water Resources 2010). As a result, flows are ephemeral in some reaches and perennial in others. The National Riparian Service Team (NRST) has classified the reach of the San Pedro River directly north and south of the project area as perennial (NRST 2012), and ADOT and ADOT contractors found 1 to 10 in of water in the river channel during five field visits that occurred from February 19, 2013 to July 8, 2015 as part of planning effort for this project.

SR 92 crosses the San Pedro River 3 miles north of the border with Mexico in a transition zone between the Chihuahuan Desertscrub and Semidesert Grassland biotic communities. The highway crosses an approximately 300-ft wide riparian corridor dominated by Fremont cottonwood and Gooding's willow, with velvet mesquite in the surrounding floodplain terrace. Some scattered seep willow can be found along the banks. The understory is comprised primarily of Johnson grass (*Sorghum halepense*). Grasses also dominate the landscape outside the riparian corridor, and include sideoats grama (*Bouteloua curtipendula*), sacaton (*Sporobolous* spp.), deergrass (*Muhlenbergia* spp.), desert saltgrass (*Distichlis spicata*), and bristlegrass (*Setaria leucopila*).

The SR 92 crossing forms one of the borders of the San Pedro Riparian National Conservation Area (NCA), which extends from the Town of Saint David south to the International Border and is managed by the U.S. Bureau of Land Management (BLM). The NCA occurs in two segments, one extending from the Mexican border north to SR 92 (at the project limits), the other extending from a point two mi north of SR 92 to Saint David. The 2-mi segment of the river north of SR 92 was not included in the NCA because lands there are privately owned.

Within the project limits, the San Pedro River consists of the wetted (low flow) river channel, approximately 30 feet wide, a low gradient, a defined bank two to five ft high, and a surrounding floodplain terrace paralleling both sides of the river corridor. The floodplain extends approximately 110 ft from the edge of the river channel to the west and approximately 150 ft to the east. The unregulated flow regime here allows for periodic flooding, and flooding can be extreme. In September 2014, floodwaters nearly overtopped the SR 92 bridge (J. Fyfe, ADOT, EPG, personal communication, January 15, 2016).

Status of the Species and Critical Habitat Within the Action Area

Western Yellow-billed Cuckoo

The San Pedro River supports one of the largest remaining breeding populations of western yellow-billed cuckoos (FR79 FR 48548). The river also provides an important dispersal and migration corridor for cuckoos (Halterman 2009).

Cuckoo surveys were not done for the purposes of the proposed action, but surveys in the NCA, conducted by Fort Huachuca, a nearby U.S. Army garrison, indicate that cuckoos are likely to occur in the project limits. During seven years, between 2001-2009, surveys for southwestern willow flycatchers and the cuckoo were conducted along eight long-term monitoring transects in the NCA, resulting in 22-81 cuckoo detections each year that surveys were done (Vernadero Group 2009). The surveys were repeated in 2012 and 25 cuckoo detections occurred during that effort (AGFD 2015). Many of the detections from 2001-2012 occurred from SR 92 upstream to the international border; thus, were within 3 mi of the project limits. In 2009, one detection occurred within 0.25 mi of the project limits. Numerous cuckoo detections also occurred downstream of SR 92, but all of these observations were at least 3 mi north of SR 92.

The above surveys were done to assess presence or absence of cuckoos along the survey transects, using call-playback methods, and results were expressed accordingly as the total number of

detections during the breeding period. Cuckoos are highly mobile and secretive birds and it is easy to overestimate or underestimate cuckoo populations based on detection data alone (Halterman et al. 2015). To complicate matters, cuckoo populations can vary sharply among years, and it is difficult to determine if detections represent breeding birds or migrants. Breeding can only be confirmed by finding an active nest, seeing fledglings, distraction or alarm displays, or copulation (Halterman et al. 2015). As a result, the number of breeding pairs or individuals that simple counts represent is difficult to determine, and we cannot say with certainty if nesting has occurred in or near the project limits. Cuckoos probably move through the area during migration and are likely to forage within the project limits.

Critical habitat for the cuckoo was proposed in 2014 and included the 21,786-ac Upper San Pedro River Unit, extending approximately 83 mi from Saint David upstream (south) to the border with Mexico. Lands in the critical habitat unit are privately owned or managed by the Arizona State Lands Department or BLM. Proposed critical habitat for the cuckoo includes the gallery forests and extends at least to the edge of the floodplain on both sides of the river.

The proposed critical habitat unit on the San Pedro River in general contains sufficient amounts of the essential physical or biological features (PCEs 1-3; riparian woodlands, adequate prey base, and dynamic riverine processes) that are essential for the conservation of the species and that may require special management considerations or protection. Within the project limits, however, PCE 2 appears to be sufficient to meet the cuckoo's habitat needs, but PCE 1 and PCE 3 are deficient.

PCE 1 (Riparian Woodlands)

PCE 1, as described in the proposed rule designating cuckoo critical habitat (79 FR 48548), includes mixed willow and cottonwood riparian vegetation, in contiguous or nearly contiguous patches that are greater than 325 ft in width and 200 ac or more in extent. Habitat patches contain one or more nesting groves that have canopy closure >70 percent. Additional guidance (e.g., Halterman et al. 2015), stressed the need for recognizable sub-canopy layers and an understory of smaller trees and shrubs. The multilayered, dense canopy provides shade and traps moisture to create the relatively cooler and more humid streamside conditions which are believed to be important for cuckoo nesting success.

The flood plain within the project limits supports a mature, even-aged cottonwood/willow gallery forest, approximately 260 ft wide, with scattered mesquite along the gallery's edges, and an understory comprised primarily of grasses and forbs. The woodland is continuous with similar habitats upstream and downstream of SR 92. At its widest point, approximately 0.3 mi south of the bridge, the cottonwood-willow gallery widens to approximately 770 ft. Canopy closure within the project limits is typically well below 70 percent. Thus, the riparian gallery here lacks the closed canopy, complex understory, and the spatial extent that ensures the cool, moist conditions that cuckoos prefer.

PCE 2 (Adequate Prey Base)

The perennial stream and riparian woodlands within the project limits would likely provide an adequate prey base of large insects and tree frogs for nesting, foraging, and dispersing cuckoos.

Given the river's low gradient and low flow rates, emergent aquatic insects are also likely to be available. Cicadas, grasshoppers, caterpillars and dragonflies were observed during ADOT field visits that occurred from 2013-2015, during the planning effort for this project.

PCE 3 (Dynamic Riverine Processes)

Cuckoos depend on dynamic river systems that provide for periodic movement and deposit of sediments, and regeneration of riparian vegetation, leading to woodlands with variously aged patches from young to old. Low gradient perennial streams with broad floodplains, like the San Pedro River's upper reaches, should provide the conditions to support high quality cuckoo habitat. At the SR 92 reach, the river has a natural flow regime (i.e., it is perennial), and the river floods periodically allowing for processing of sediment loads. However, the cottonwood/willow gallery forest is an even-aged, mature stand with a grass/forb understory, indicating that no recruitment of riparian tree species is occurring at this time or has occurred for a number of years. This may be a result of inadequate groundwater (see discussion below), or flooding may be too infrequent, or flows generally inadequate, to clear the incised riverbanks and to create the conditions necessary for regeneration of cottonwoods and willow.

Northern Mexican Gartersnake

Critical habitat for the gartersnake was proposed in 2014 and included the 22,669-ac San Pedro River Subunit, extending 158.4 mi from the San Pedro/Gila River confluence at Winkelman upstream (south) to the International Border, in Cochise, Pima, and Pinal Counties, Arizona. The subunit occurs predominately on private lands, with remaining lands managed by BLM.

In general, the proposed critical habitat unit also contains sufficient amounts of the essential physical or biological features (PCEs 1-4) that are essential for the conservation of the species and that may require special management considerations or protection. However, PCE 4 (absence or low level of harmful nonnative species) is deficient in this subunit (78 FR 41550), and within the project limits PCEs 1-3 (aquatic habitat, terrestrial space, and prey base) are only marginally sufficient to meet the habitat needs of the gartersnake.

PCE 1 (Aquatic or Riparian Habitat)

As we discussed above, the upper San Pedro River has a natural flow regime, but within the project limits the river is characterized by a well-defined (entrenched) channel approximately 30-ft wide with banks 2-5 ft high. Because of the entrenched channel and high banks, the river here lacks in-channel pools, off-channel pools, and backwater habitats that are important to gartersnakes. In addition, the organic and inorganic structural complexity along the shoreline that would 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) is largely absent. Thus, the aquatic habitat needs of the gartersnake are only marginally met at the San Pedro River crossing.

PCE 2 (Terrestrial Space)
Within the project limits, the San Pedro River flows through a flood plain terrace that extends approximately 260 ft across the river corridor. This is well short of the 600 ft of adequate terrestrial space on either side of the riverbank required by PCE 2. Outside the floodplain, the riparian zone gives way to open desert scrub habitat, then to landscapes that are highly disturbed by agricultural activities and other human developments. Some small debris piles occur outside the shoreline area, but structural complexity, woody vegetation, and woody debris, as with the riverbanks, is generally lacking on the floodplain.

PCEs 3-4 (Prey Base and Absence of Nonnative Species)

The proposed rule designating critical habitat for the gartersnake states that native fish and lowland leopard frogs occur throughout the San Pedro River and provide a prey base for northern Mexican gartersnakes, with prey population densities increasing in the downstream direction (away from the project area). Crayfish, bullfrogs, and nonnative, spiny-rayed fish occur predominately upstream of the I-10 crossing, where the project area occurs (the SR 92 crossing is approximately 70 mi upstream of I-10). Rosen et al. (2001) surveyed the upper San Pedro River, at Curtis Flat in 1996, Lewis Springs in 1998, and the SR 90 crossing in 2000 (the SR 90 bridge is 12 mi north of SR 92), and documented crayfish, bullfrogs, nonnative, spiny-rayed fish, and two species of native fish, all occurring at various densities along the routes surveyed (however, they did not detect gartersnakes). Kesner and Marsh (2010) also found native fish and nonnative, spiny-rayed fish in the upper San Pedro River, although native fish or nonnative, soft-rayed fish outnumbered harmful nonnative fish species significantly. Jakle (1992) and Minckley (1987) also reported nonnative, spiny-rayed species such as channel catfish, flathead catfish, and smallmouth bass in the San Pedro River. Inman et al. (1998) reported the presence of crayfish in the San Pedro River, and Propst et al. (2008) reported that at least 15 species of nonnative fish have been introduced. None of these studies reported native amphibian populations in the upper San Pedro River.

In summary, we cannot conclude that a viable native prey base exists within or immediately outside the project limits on the upper San Pedro River.

Factors Affecting the Species and Critical Habitat in the Action Area

Factors that may affect the cuckoo and its proposed critical habitat and proposed critical habitat for the gartersnake are linked in part to BLM management of the San Pedro Riparian National Conservation Area that will ensure the long term function and sustainability of the San Pedro River. The NCA was designated by Congress in 1988 and contains 57,000 ac of public land and 40 mi of the upper San Pedro River. One of the first major decisions by BLM, made in 1989, was to end permitted livestock grazing in areas along the river. This allowed development of riparian vegetation on the floodplain, improved water retention, and increased flows. The results are evident today in the form of the extensive and continuous cottonwood/willow gallery forests that now occupy the river's floodplain.

As we noted above, however, galleries within the project limits lack the multi-layered understory that cuckoos prefer, and the channel and floodplain lack the structural complexity (e.g., backwaters, presence of dead and downed trees and other debris) that the gartersnake needs for escape cover and for other life functions. Several factors may account for these deficiencies,

including infrequent or inadequate periodic flooding and groundwater depletion. Inadequate flooding may be due in part to abnormally dry conditions in much of Arizona (Arizona Drought Monitoring Technical Committee 2015). The incised channel within the project limits may contribute to issues related to drought by preventing occasional high flows from reaching the floodplain. Extreme flows in 2014 deposited a considerable amount of woody debris on the floodplain and around the bridge piers, but ADOT removed the debris due to safety concerns, i.e., the effects of scour around the bridge piers.

According to NRST report (NRST 2012), the upper San Pedro River is currently evolving from a major period of channel incision to one of floodplain building. This suggests that conditions within the project limits may improve for cuckoos and gartersnakes in the future. Most reaches of the river north of SR 92 and within the NCA are in proper functioning condition. The reach upstream (south) of SR 92, however, is currently functioning but at risk due primarily to the fact that sandy sediments in the middle of the reach (3 mi upstream of the project limits) are not being processed, leading to dry areas where flow is below the surface sands and gravels.

The NRST stresses the need to resolve groundwater issues in the San Pedro River aquifer if upward trends are to continue. Studies show that groundwater is being pumped in excess of recharge, and if the trend continues the gains of recent years will be lost along with a functioning and sustainable riparian system. If groundwater recharge to the San Pedro River is lost, the impacts will likely be irreversible. Under a scenario that features continuing improvements to the ecological function of this river (in particular and especially an increase in groundwater recharge), the riparian habitats that we have considered (i.e., proposed critical habitats for the cuckoo and gartersnake) should continue to develop and improve, as they have done since 1989.

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.

Western Yellow-billed Cuckoo

In Arizona, cuckoos breed between May 15 and September 30. Construction activities for the new SR 92 bridge are scheduled to begin in September 2016 and will take approximately 11 months to complete. As a result, construction activities could affect suitability of the area breeding cuckoos through the 2016 and 2017 breeding periods. Even if cuckoos do not breed within the project limits, they may forage in the area during the breeding period and are likely to move through the area during dispersal and migration. Thus, bridge construction will overlap breeding and migration periods during two calendar years, and noise levels and human activities may cause cuckoos to avoid using the area near the bridge during construction. Any use of habitat upstream and downstream of the project area will not be affected.

Proposed Critical Habitat
The project will require the removal of approximately 31 Fremont cottonwoods, 17 Gooding's willows, 8 velvet mesquites, and 2 Arizona walnuts within approximately 0.76 ac of the narrow San Pedro River floodplain. Thus, bridge construction will result in the loss of a PCE of cuckoo critical habitat, riparian woodland, within the immediate vicinity of the bridge. In addition, removal of trees and vegetation in the construction zone would reduce habitat for cuckoo prey species in the same area, thereby directly affecting the PCE of adequate prey base. Diverting flows around one bridge pier that will be removed during bridge construction will have temporary minor effects in the immediate vicinity of the bridge, but would not affect the dynamic riverine processes that comprise PCE 3.

Although the project will require removal of 58 trees, the continuity of the riparian woodland upstream and downstream of the bridge will be maintained, and given the planned revegetation program that will occur after construction, the effects of tree removal on the woodland structure and prey base will be temporary. In fact, tree planting within the project limits in just a few years should provide a habitat element that is currently lacking on the floodplain: subcanopy layers of native trees. Diversion of flows within the river channel during removal of one pier will last for just two weeks, and removal of the pier ultimately will improve flows within the river channel.

Northern Mexican Gartersnake Proposed Critical Habitat

Construction activities that may affect gartersnake proposed critical habitat include: 1) construction of access roads to allow movement of heavy equipment onto the floodplain; 2) clearing and grubbing of work areas for constructing abutments for railcar bridges, pier shaft drilling for new piers, and new pier construction; and 3) removal of an existing pier from the river. Construction of access roads, staging areas, and work areas will involve tree removal (as described above for the cuckoo) and grading and contouring of the floodplain and riverbanks to establish stable work platforms. Establishing work platforms will also require placement of temporary pipe culverts in an ephemeral wash, which enters the project limits from the northeast, and covering the culverts with earthen material. To remove the existing bridge pier from the river channel, a coffer dam, berm of native channel material, or diversion structure such as a temporary concrete barrier will be placed in the river to push flows around the pier for up to two weeks so that equipment can access and remove the concrete pier. After the pier is removed the barrier will be removed and flows will resume unimpeded below the bridge. Construction activities will affect approximately 0.76 ac of gartersnake proposed critical habitat.

Overall, habitat conditions for the gartersnake within the project limits are marginal and construction activities as described above are unlikely to permanently or negatively affect any of the PCEs of gartersnake critical habitat. As we discussed above, the river channel within the project limits is entrenched with banks two to five ft high. As a result, the channel lacks in-channel pools, off-channel pools, and backwater habitats that are important to gartersnakes. In addition, organic and inorganic structural complexity along the shoreline and on the floodplain is lacking. Turbidity will increase temporarily within the river during construction, which could affect native fishes (PCE 3); however, mitigation measures outlined in the BE include measures to maintain water quality. For example, grubbing and grading within the project limits will be kept to the minimum required for constructability, and spanning the river with a rail car bridge

has been proposed specifically to avoid the need for heavy equipment to enter the river channel. In addition, some of the proposed conservation measures may result in net benefits to gartersnake habitat. Re-contouring disturbed areas after construction may reduce the effects of the incised channel, and adding structural features such as coarse woody debris (limbs and branches) in piles along the edges of the channel and on the floodplain will increase shoreline complexity and provide escape cover for gartersnakes that is currently lacking. Finally, construction activities as proposed should have no effect on PCE 4 (absence of harmful nonnative species).

CUMULATIVE EFFECTS

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

Habitat for the cuckoo and gartersnake include areas of State and private lands where livestock grazing (including unauthorized grazing) could occur (NRST 2012). Livestock grazing could lead to direct fatality of gartersnakes (by trampling of individuals), and could further degrade the watersheds and habitats of cuckoos and gartersnakes due to trampling and the establishment and spread of invasive plants. However, grazing is not permitted in the floodplains or within adjacent riparian woodlands on State lands, and as we mentioned previously, livestock grazing is no longer permitted on BLM lands in the San Pedro Riparian National Conservation Area. Other, unregulated, activities could include inappropriate off-highway vehicle use and other recreational activities, and activities that are difficult to regulate such as cross-border activities from Mexico, all of which can increase human traffic and access to critical habitat, and increase fire risk, trash deposition, and contamination of surface and groundwater.

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.

Western Yellow-billed Cuckoo

After reviewing the current status of the cuckoo, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the cuckoo. It is out conference opinion that the proposed action is not likely to adversely modify proposed critical habitat. We base these conclusions on the following reasons:

- Breeding habitat in the project limits is marginal and breeding activity is unlikely to be affected by the proposed action.
- Use of the area for dispersal, foraging, and migration will be temporarily disrupted during construction, but habitat for dispersal, foraging, and migration is abundant upstream and downstream of the project limits. The removal of 58 trees within 0.76 ac of habitat is not

expected to affect the persistence of cuckoos along the upper San Pedro River. Habitat lost as a result of this project will be restored over the long term through re-vegetation and tree planting that will occur after completion of the project.

- The project will have some beneficial effects: 1) the creation of subcanopy layers within the riparian gallery forest as a result of tree planting; and 2) less impeded flows in the river channel due to removal of an existing bridge pier (note that none of the new piers will constructed within the river channel).
- The proposed action will occur within a very small area (<1 acre) of the 21,786-ac Upper San Pedro River Critical Habitat Unit, i.e., <0.000046% of proposed critical habitat on the Upper San Pedro River and <0.000002% of proposed critical habitat rangewide. Proposed critical habitat will remain functional for conservation and recovery of the cuckoo.

Northern Mexican Gartersnake

After reviewing the current status of the gartersnake, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's conference opinion that the proposed action is not likely to destroy or adversely modify proposed critical habitat for the northern Mexican gartersnake. We base this conclusion on the following reasons:

- Habitat conditions within the project limits are only marginally suitable for the gartersnake. The project will enhance the short term suitability of habitat by improving the complexity of shoreline features in the form of piles of woody debris that will be created after construction for that specific purpose.
- Turbidity in the San Pedro River will increase due to project activities but the increase will be temporary and will cease with completion of the project. Any effects to water quality would be small and short-term and should not compromise the function of this primary constituent element.
- The project will have no long term effects on gartersnake prey species nor will the project affect the occurrence of harmful nonnative species in the river.
- The proposed action will occur within a very small area (<1 acre) of the 22,669-ac San Pedro River Critical Habitat Subunit, i.e., <0.000044% of proposed critical habitat on the San Pedro River and <0.000002% of proposed critical habitat rangewide. Proposed critical habitat will remain functional for conservation and recovery of the gartersnake.

INCIDENTAL TAKE STATEMENT

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

lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FHWA and ADOT so that they become binding conditions of any grant or permit issued to FHWA or ADOT, as appropriate, for the exemption in section 7(o)(2) to apply. FHWA and ADOT have a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to assume and implement the terms and conditions; or (2) fails to require ADOT to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA and/or ADOT must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

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

- Breeding habitat in the project limits is marginal.
- There is ample dispersing, foraging, and migration habitat in the project vicinity. We do not expect these activities to be significantly disrupted by the project.
- Future maintenance activities cannot with reasonable certainty be expected to affect dispersing, foraging, or migrating birds.

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

REINITIATION NOTICE

This concludes our biological opinion for the proposed SR 92 San Pedro River bridge replacement project, and its effects on the western yellow-billed cuckoo, and it concludes our conference opinions for the effects of that project on cuckoo and gartersnake critical habitats. You may ask the FWS to confirm these conference opinions (for cuckoo and gartersnake critical habitats) as biological opinions issued through formal consultation if critical habitat for these species is designated. The request must be in writing. If the FWS reviews the proposed action and finds there have been no significant changes in the action as planned or in the information

used during the conference, the FWS would confirm the conference opinions as biological opinions for the project and no further section 7 consultation would be necessary. Please note that our concurrences for your determinations that the proposed project "may affect, but is unlikely to adversely affect" the cuckoo and gartersnake are contained in Appendix A, following these opinions.

This also concludes formal and conference consultation on the FHWA and ADOT proposal to rebuild the SR 92 San Pedro River bridge. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (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 adversely 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 a listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

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

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

For further information please contact Robert Lehman (602) 242-0210 (x217) or Brenda Smith at (928) 556-2157. In all future correspondence on this project, please refer to consultation number 02EAAZ00-2015-F-0030.

Sincerely,

Brenda H. Smith

for Steven L. Spangle
Field Supervisor

cc (electronic)

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APPENDIX A: CONCURRENCES

This appendix contains our concurrences with your determination that the proposed action "may affect, but is not likely to adversely affect" the endangered southwestern willow flycatcher and the threatened northern Mexican gartersnake.

Southwestern Willow Flycatcher

Flycatcher surveys were not performed independently for this project because the understory of the mature cottonwood/willow gallery forest at the SR 92-San Pedro River crossing lacks the dense thickets of shrubs and small trees that characterize flycatcher breeding habitat (the understory is comprised primarily of grasses and forbs). Detection of nesting flycatchers on the upper reaches of the San Pedro River occurred infrequently during the 2000s. Flycatcher surveys have occurred in the San Pedro Riparian National Conservation Area (NCA), parts of which lie north and south of the project area. These surveys occurred from 2001 to 2012 (Vernadero Group 2009, U.S. Fish and Wildlife Service 2014) and resulted in flycatcher detections at two locations. A pair of flycatchers nested unsuccessfully near the Hereford Bridge in 2005, approximately 4 miles north of the project limits. In 2008, flycatchers were banded near Kingfisher Pond, approximately 11 miles north of the project limits. An unconfirmed observation of a flycatcher occurred adjacent to the project limits in 2002. No confirmed breeding attempts have occurred in the NCA since 2005.

Vegetation in the project area is suitable for use by migrating flycatchers and the river itself has a low gradient and the low flow rates necessary to support emergent aquatic insects, an important food source for flycatchers.

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 reasons described below.

- Based on survey information detailed in the BE, and the lack of suitable nesting habitat, it is extremely unlikely that breeding flycatchers occur in the project area; therefore, any potential direct or indirect effects to breeding flycatchers are discountable.
- The project would remove trees that may be used by flycatchers during migration, and construction activities would overlap the flycatcher migration period and could directly affect flycatcher use of the project area for resting and foraging. Given the small area affected by the project (<1 ac) and the availability of riparian habitat nearby, the effects to migrating flycatchers would be insignificant.
- Required sediment and erosion controls that will be implemented during construction would prevent sediment transfer to the San Pedro River that could reduce the availability of emergent aquatic insects as prey for flycatchers.

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Northern Mexican Gartersnake

Species specific surveys for the northern Mexican gartersnake were not done for the purposes of this project because the subspecies has not been documented on the San Pedro River for nearly 20 years and it may be extirpated from the drainage. Historical records dating back to the early 1900s, and more recent reports, confirm that the gartersnakes occurred on the upper San Pedro River until at least 1996, when a detection occurred at Lewis Springs, nearly 20 miles downstream (north) of the project area (USFWS 2014). Gartersnake detections have also occurred at the Town of Hereford, 7 mi north (downstream) of the project area, and at the SR 90 San Pedro River Bridge, 8 mi further downstream. An observation from 1957 near Palominas, a small community just west of the SR 92 bridge, may have occurred in or near the project area.

The current status of the gartersnake on the upper San Pedro River and within the project limits is unknown. In 2008, we considered the gartersnake to be extirpated on the San Pedro River (see our 12 month finding on the petition to list the gartersnake as threatened; 79 FR 38678). In the 12 month finding, "extirpated" meant that there had been no gartersnakes reported for a decade or longer at a site within the historical distribution of the species, despite survey efforts, and that there was no expectation of natural recovery at the site due to the presence of known or strongly suspected causes of extirpation. In this case, the presence of harmful nonnative species on the upper San Pedro River no doubt was a primary cause of gartersnake declines. In the final rule that listed the gartersnake as threatened, we concluded that the gartersnake population in the San Pedro River was "likely not viable," meaning that there had been at least one record of the subspecies after 1980 (there was one record in 1996), that gartersnakes would not be reliably found with minimal to moderate survey effort, and that threats exist which suggest the population may be at low density or that it is extirpated; however, evidence is insufficient to support extirpation. Thus, we consider the gartersnake population along the San Pedro River to be in poor condition at least, likely not viable in the long-term, or extirpated. If gartersnakes are present, we expect that harmful nonnative species will keep the subspecies at low to very low densities along this river indefinitely.

Conservation Measures

- Sediment and erosion controls (use of wattles, seeding of disturbed areas, replacement of lost trees) will prevent siltation of the San Pedro River during and after construction and consequent impacts to gartersnake aquatic prey.

- No erosion control products (e.g., wattles) containing mesh or netting with an opening 0.25 in or greater will be used within 600 ft of the San Pedro River (gartersnakes can become entangled in larger mesh sizes).
- The contactor will replace escape cover eliminated by construction activities and create additional cover for the gartersnake by stacking debris from tree clearing activities (sticks, branches, limbs) into piles along the river bank within the project area.

DETERMINATION OF EFFECTS

We concur with your determination that the proposed action "may affect, but is not likely to adversely affect" the northern Mexican gartersnake for the reasons described below.

- Proposed conservation measures (use of appropriate erosion control products, creation of escape cover, biological monitoring) provide protection for gartersnakes from sedimentation and entrapment such that any effects would be insignificant.

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U.S. Fish and Wildlife Service. 2014. Biological opinion for the Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona. Arizona Ecological Services Office, Phoenix, Arizona.