United States Department of the Interior

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In reply refer to:
02EAAZ00-2015-F-0270

June 3, 2019

Mr. Joshua Fife, Biology Team Lead
Arizona Department of Transportation
Environmental Planning
1611 West Jackson Street
Phoenix, Arizona 85007

RE: State Route 260 Little Colorado River Bridge Scour Retrofit Project
FHWA File # 260-C(204)T
ADOT File # 260-AP-394-H8269-01C

Dear Mr. Fife:

Thank you for your June 12, 2018, request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544), as amended (Act). Your request was dated June 12, 2018, and was received by us via electronic mail (email) on the same day. At issue are effects that may result from a proposed scour retrofit and culvert extension project at the Little Colorado River (LCR) bridge on State Route (SR) 260 (hereafter the LCR bridge) within the town of Eagar, Apache County, Arizona. The proposed action may affect the threatened Little Colorado spinedace (*Lepidomeda vittata*) (spinedace). Below we provide a biological opinion (BO) on effects of the proposed action on the spinedace.

In your letter, you requested our concurrence that the proposed action is not likely to adversely affect the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher) and endangered New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) (jumping mouse). We concur with your determinations for the flycatcher and jumping mouse and provide our rationales in Appendix A.

This BO is based on information provided in the revised biological evaluation (BE) for the project, dated June 1, 2018, email correspondence, telephone conversations, and field investigations. Literature cited herein is not a complete bibliography of all literature available on the species of concern, bridge construction projects and their effects, or on other subjects considered in this opinion. A complete administrative record of the consultation is on file at this office.

CONSULTATION HISTORY

November 17, 2016	We received your first request for formal consultation, dated November 15, 2016, and a BE for the project, dated October 6, 2016. The proposed action at that time was a full bridge replacement.
November 29, 2016	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.
February 2016	We received notification from ADOT that the project had been placed on hold for a design review.
September 7, 2017	ADOT notified us that the project was undergoing redesign as a bridge scour retrofit.
June 12, 2018	We received your second (the current) request for formal consultation, dated June 12, 2018, and a BE for the scour retrofit, dated June 1, 2018.
July 12, 2018	We sent a 30-day letter indicating that all information required to initiate consultation was either included with your consultation request and the BE or was otherwise accessible to us.
September 7, 2018	We received your amendment to the June 1, 2018 BE which incorporated new information on the New Mexico meadow jumping mouse based on field surveys for the species that occurred from July 28-30, 2018 within the proposed construction footprint.
April 2, 2019	We received the fish and aquatic species salvage protocol for this project, dated March 26, 2019.
May 22, 2019	We sent ADOT the draft BO.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

A complete description of the proposed action is found in the BE for the project. The following summary of the proposed action is taken from the BE. Maps, photographs, and diagrams related to the action are included in the BE and are incorporated herein by reference.

ADOT, in association with FHWA, is planning a scour retrofit project for the LCR bridge (Structure #416) on SR 260 at MP 394.75, and a culvert extension project for the Water Canyon Creek Box Culvert at MP 394.90. The LCR bridge is a 95-foot (ft)-long, 29-ft-wide, three-span structure with gabion basket bank protection at its abutments but no scour floor. The Water Canyon Creek culvert is a six-ft-wide, seven-ft-high, 25.5-ft-long one-barrel reinforced concrete box culvert with headwalls and wingwalls. Both structures are experiencing erosion, which has decreased their integrity and lifespans. The purpose of the project is to prevent further erosion and restore the integrity of the bridge and box culvert.

In this BO, we use the terms construction footprint and action area to provide spatial references. The *construction footprint* includes all areas within the affected environment where permanent and temporary surface disturbances will occur. For this project, the construction footprint will encompass approximately 1.07 acres (ac) at the LCR bridge and the Water Creek Canyon box culvert where vegetation removal, access and staging, dewatering of the work area, and the scour retrofit will occur. Approximately 0.96 ac of these disturbances will be temporary.

We use the term *action area* to describe all areas of the environment that may be affected by the project, extending out from and including the construction footprint. Typically, the action area is the total area included in our effects analysis; however, the term also has a statutory definition (see below).

The scour retrofit will require the following actions:

- Constructing two temporary access roads at the LCR bridge;
- Installing staging and stockpiling areas—one at the LCR bridge and one at the Water Canyon Creek culvert;
- Installing water diversion structures in the LCR to provide dry work areas under the bridge;
- Installing a six-inch concrete scour protection floor with cut-off walls that extend 10 feet beyond the existing bridge;
- Repairing damage to the eastern pier of the bridge;
- Laying a new four-inch layer of shotcrete over the existing gabion bank protection at the bridge;
- Extending the existing Water Canyon Creek box culvert and installing a riprap apron at its outlet;
- Removing temporary access roads, staging and stockpiling areas, and water diversion structures once construction is complete;

- Removing and replacing existing fencing and guardrail, as needed;
- Seeding all temporarily disturbed areas with a native seed mix.

Access and Staging

Before construction on the bridge begins, work crews will construct two 15-ft-wide access roads north of SR 260, one east and one west of the LCR bridge (Appendix A, Figure 1). The west access road will originate from a dirt road that runs north from SR 260 and will extend to the western bank of the LCR. The east access road will originate from SR 260 and extend to the east bank of the LCR. Crews will clear and grub both access roads of vegetation, and each road will then be graded, compacted, and stabilized, likely with gravel. The Water Canyon Creek box culvert can be accessed easily from SR 260 without the need for an access road. Access roads at the bridge will require approximately 0.26 ac of temporary ground disturbance.

Crews will also construct two staging and stockpiling areas before construction begins, one about 200 ft east of the bridge and south of SR 260, and another about 200 ft east of the Water Creek Canyon box culvert and north of SR 260. Crews will clear and grub both areas of vegetation, and grade, compact, and stabilize each area with gravel before they are used. Combined, the two staging and stockpiling areas will result in 0.21 ac of temporary ground disturbance.

Off-Road-Vehicle Areas

Design plans for this project designate three areas within the construction footprint as off-road vehicle (ORV) use areas (Appendix A, Figure 1). Trucks and other construction vehicles will operate in these areas without surface preparations (grading, compacting, etc.). One ORV area will connect the staging area at the LCR bridge to SR 260 and the east access road. ADOT designated two ORV areas at the Water Creek Canyon box culvert, one at the culvert inlet south of SR 260, and one at the outlet north of the highway. Ground disturbances resulting from trucks and other construction equipment operating off road in the construction footprint will involve 0.41 ac of temporary ground disturbance.

Water Diversions

Workers will construct two temporary bypass channels in phases to divert the river from work areas under the bridge. The Phase 1 bypass will direct water to the easternmost span of the bridge to dry the area below the west span. Workers will place a shotcrete layer over the gabion around the west bridge abutment and install the scour floor below the west span. The Phase 2 bypass will direct water to the western bridge span and expose the east pier and east and middle bridge spans. Crews will then place shotcrete over the gabion around the east bridge abutment, install the scour floor below the middle and east spans, and repair the east pier.

Each water diversion structure will consist of a 20-ft-wide earthen channel and earthen berms 4-5 ft wide on each side of the channel. Crews will excavate the channel with a backhoe and will use the excavated material to build up a berm on each side of the channel. Once each bypass channel has been constructed, crews will divert the river into the channel and use water pumps or a hydro-vacuum to remove water remaining in pools and backwaters from the work area. Crews will pump water from the work area back into the LCR through a filtration system, e.g., a

sediment trap, filter fabric, or settling basin, to remove sediments. Water diversion structures will result in 0.08 ac of temporary ground disturbance.

Fish Salvage Protocol

Before and during dewatering of the work area under the bridge, qualified fish biologists will remove and translocate spinedace, other native fish, and native frogs from the LCR following a salvage protocol developed for this project (ADOT 2019). The salvage protocol presents a generalized set of procedures for 1) installing fish exclusion materials, e.g., block nets, around the area to be dewatered; 2) removing as many fish and frogs as possible before dewatering using a combination of seins, baited minnow traps, electrofishing, or dip nets and hand removal; and 3) during dewatering, salvaging fish that were not captured earlier by fitting pumps with fish screens of an appropriate mesh size. Biologists will repeat these procedures until they are confident there are no aquatic species still present in dewatered areas. Biologists will not release crayfish (e.g., *Orconectes virilis*) back to the LCR, and will release fish at regular intervals during salvaging (every few hours) to reduce holding stress. Release sites will be identified before dewatering occurs and may include sites upstream and downstream of the LCR bridge.

Shotcrete Protection

Shotcrete is concrete or mortar conveyed through a hose and pneumatically projected at high velocity onto a surface as a construction technique. Installing shotcrete bank protection at the LCR will involve exposing the underground portion of the existing gabion basket and removing any vegetation growing through the bank protection. Once the gabion basket is exposed and free of vegetation, crews will spray shotcrete on top of the basket in a four-inch layer. Bank protection will result in 0.03 ac of permanent ground disturbance.

Bridge Scour Protection Floor

After shotcrete has cured, work crews will use heavy machinery to excavate the extent of the scour protection floor and cut-off walls. Once excavated, crews will build a form, install rebar, and pour concrete. The scour protection floor will span the entire length of the bridge and extend 10 ft upstream and downstream of the bridge, for a total length of approximately 49 ft. The finished floor will be 6 inches thick with a 4-ft upstream cut-off wall and a 6-ft downstream cut-off wall. The scour protection floor will tie into the existing piers and the new shotcrete bank protection. The scour floor will require about 0.07 ac of permanent ground disturbance.

As mentioned above, crews will construct the scour protection floor in two parts, the western span first, followed by the center and eastern spans. When construction is occurring within the center and eastern spans, crews will repair the eastern pier. Repairing the eastern pier will involve cleaning the damaged area, patching it with the appropriate treatment, and sealing the patch to prevent future damage. Work on the shotcrete banks, the scour floor, and repair of the east pier will take approximately 80 calendar days to complete.

Water Canyon Creek Box Culvert Extension

Before extending the existing box culvert, crews will remove the existing headwalls and wingwalls by saw-cutting the walls and hauling away the removed portions. Crews will then excavate the footprint of the new culvert, build a form, and fill the form with concrete. Workers will extend the culvert by halves, first at the south inlet, and then at the north outlet (although the sequence may be reversed at the time of construction). The culvert inlet south of SR 260 will be extended 13.5 ft with new 24.5-ft-long sloped wingwalls and a 20-ft-wide level headwall. Crews will extend the culvert outlet north of SR 260 14 ft with the same wingwall and headwall dimensions as the inlet. Finally, crews will install a new 10-ft by 29-ft riprap apron over the outlet. Construction activities at the box culvert will result in 0.01 acre of permanent ground disturbance due to the culvert extension, installation of new headwalls and wingwalls, and construction of the outlet riprap apron.

Vegetation Removal

Project activities at the LCR bridge will require the permanent removal of a dense patch of narrowleaf willow (*Salix exigua*) growing through the existing bank protection, a juniper tree (*Juniperus* spp.), and 0.003 ac of riparian herbaceous vegetation within the footprint of the new scour floor. Staging and stockpiling, off-road vehicle use, and construction of the temporary access roads will temporarily affect 0.51 acre of floodplain and upland grasses and forbs. Approximately 0.01 acre of riparian herbaceous wetland vegetation will also be temporarily impacted by the water diversion structures.

Extending the culvert on Water Canyon Creek will involve removal of five Russian olive trees (*Elaeagnus angustifolia*) north of SR 260. Staging and stockpiling and off-road vehicle use will temporarily affect 0.32 ac of upland grasses and forbs and 0.06 ac of wetland vegetation along Water Canyon Creek.

Schedule

Construction will occur from August to December 2019.

Applicable Design Standards and Best Management Practices

Mitigation measures outlined in the revised BE (pages 23-26) include design standards and best management practices (BMPs) (e.g., ADOT 2008, 2012) to control the spread of noxious weeds, avoid negative effects to soils and water quality, control erosion, and rehabilitate disturbed areas after construction. Design features and BMPs applicable to this project include:

- ADOT will prepare a Storm Water Pollution Prevention Plan and Spill Prevention and Pollution Prevention Plan prior to construction to assure that the proposed action will not adversely affect soils or water quality.
- The contractor will apply erosion control measures, e.g., construction of a temporary sediment basin and use of hay bales or other methods of erosion control, to prevent soils exposed during construction from entering the river.

- Prior to the start of ground-disturbing activities, the contractor will arrange for and perform the control of noxious weeds and invasive species in the construction footprint. Herbicide applications will comply with provisions outlined in the next section.
- To prevent invasive species from entering or leaving the construction footprint, crews will inspect and clean all vehicles and earthmoving equipment to assure they are free of all attached plant/vegetation material and soil/mud debris before entering or leaving the bridge construction site.
- All disturbed soils not permanently altered by shotcrete protection, the scour floor, or riprap will be recontoured and seeded after the project is completed using species native to the project vicinity.

Conservation Measures

Conservation measures are commitments to protect listed species and critical habitats in addition to those addressed under ADOT standard specifications or BMPs. The measures are species- and project-specific. Measures to protect spinedace in the LCR include the aquatic species salvage protocol discussed above, and provisions to minimize negative effects of herbicide treatments to spinedace, as outlined below.

Herbicide Treatments

- The contractor will follow general protection measures for use of herbicides, as outlined by the FWS in White (2007).
- The contractor will follow all herbicide label requirements.
- The contractor will only use herbicides labeled for use to the edges of water bodies (e.g., imazapyr) and only within recommended buffer zones.
- The contractor will not perform broadcast applications of broad-spectrum herbicides within the action area.
- During application of imazapyr (aquatic) or other appropriate aquatic formulation, the contractor will establish a buffer zone of 30 feet between the area of application and the river for spot applications, 350 feet for mechanized ground applications, and 300 feet for mechanized ground applications when a steady wind of at least 3 mph is blowing away from the body of water. Within the project limits, this applies to areas extending one mi upstream in any contributing channel, tributary, or spring run, and 300 feet downstream of any habitat of a listed species.
- Within 200 feet of the ordinary high water mark of the LCR, the contractor will apply herbicides using hand-wand backpack equipment using liquid streams or relatively coarse sprays to minimize spray drift.
- The contractor will use the lowest pressure, largest droplet size, and the largest volume of water permitted by the label during herbicide applications.

Action Area

The 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 SR 260 crossing of the LCR and the Water Canyon Creek box culvert.

The action area for this project includes 1) all areas that will be subject to vegetation removal and other surface disturbances (the construction footprint); and 2) downstream reaches of the LCR that may be affected by sediment transport during and after the project. The action area for sedimentation effects will include one mi of the LCR downstream of the bridge.

STATUS OF THE LITTLE COLORADO SPINEDACE

The Little Colorado spinedace was listed as threatened with critical habitat on October 16, 1987 (52 FR 35034). We completed a recovery plan for the species in 1998 (U.S. Fish and Wildlife Service [USFWS] 1998). We completed 5-year status reviews in 2008 (USFWS 2008) and 2018 (USFWS 2018). In the 2008 review, we recommended that the species be uplisted to endangered; however, no listing change occurred and the more recent status review (USFWS 2018) concluded that classification as threatened remains an appropriate designation for the species.

We based the 2008 recommendation to uplist on projections of water losses, non-native sportfish movements, and persistent drought conditions affecting the spinedace into the future. However, the 2018 review found that spinedace habitats are persisting and currently support robust numbers and age classes of spinedace in spite of fluctuating water levels and extreme drought. In addition, some non-native sportfish invasions that in 2008 seemed imminent were not as severe as predicted, and since 2008, the FWS and AGFD established three new spinedace populations within the species' historic range (USFWS 2018).

The spinedace is a small (about 4-inch) minnow native to the LCR drainage. This fish occurs in disjunct populations throughout much of the drainage in Apache, Coconino, and Navajo counties, Arizona. Extensive collections summarized by Miller (1963) indicate that the spinedace was extirpated from much of its historical range from 1939 to 1960. Although few collections were made of the spinedace prior to 1939, we think the species inhabited the northward flowing LCR tributaries of the Mogollon Rim, including the northern slopes of the White Mountains.

Mitochondrial DNA work on the spinedace was initiated in the 1990s and indicated the existence of three sub-groups identifiable by geographic area (Tibbets et al. 2001): the East Clear Creek drainage; Chevelon Creek; and the upper LCR, including Nutrioso and Rudd creeks. The study concluded that the genetic patterns seen were likely the result of populations being isolated and differentiated by both natural and human-caused events. The East Clear Creek and Chevelon Creek sub-groups are more individually distinctive and possess unique haplotypes, likely the result of a higher degree of isolation. Individuals from the upper Little Colorado sub-group are more similar to each other. Possibly, at least until recent times, there was one population with considerable gene flow. Later, dams and water diversions contributed to the current distribution of disjunct populations. The cause and exact timing of the isolation of the three sub-groups are not known, but Tibbets et al. (2001) recommended that all of these populations be maintained to conserve genetic variation in the species.

The spinedace is found in a variety of stream habitats (Blinn and Runck 1990, Miller 1963, Nisselson and Blinn 1989). It is unclear whether occupancy of these habitats reflects the local preferences of the species or its ability to tolerate less-than-optimal conditions. Suitable stream habitat for the spinedace is characterized by clear, flowing pools with slow to moderate currents, moderate depths, and gravel substrates (Miller 1963, Minckley and Carufel 1967). Cover provided by undercut banks or large rocks is often a feature. Surveys have located spinedace in pools and flowing water conditions over a variety of substrates, with or without aquatic vegetation, in turbid and clear water (Denova and Abarca 1992, Nisselson and Blinn 1991). Water temperatures in occupied habitats ranged from 58 to 78 degrees Fahrenheit (14.4 to 25.5 degrees Celsius) (Miller 1963).

As with most aquatic habitats in the southwest, the LCR Basin contains a variety of aquatic habitat types and is prone to severe seasonal and yearly fluctuations in water quality and quantity. Both mountain streams and lower-gradient streams and rivers have provided habitat for the spinedace. Residual pools and spring areas are important refuges during periods of normal low water or drought

Presence of non-native fish in the streams it occupies is one of the primary reasons we listed the spinedace, and along with factors discussed above, may have contributed to the disjunct distribution of populations we see today and the species' retreat to what may be suboptimal habitats. Non-native fish may compete with and prey upon spinedace and alter spinedace habitats. In the last 100 years, at least ten non-native fish species have been introduced or have expanded into spinedace habitats, including the rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*), and golden shiner (*Notemigonus crysoleucus*). Surveys in East Clear Creek have documented the presence of these three non-native species and brown trout (*Salmo trutta*) (Denova and Abarca 1992). Experimental data and field observations indicate that at least the rainbow trout is a predator and potential competitor with the spinedace (Blinn et al. 1993).

The spinedace likely still occupies the streams it is known from historically (Chevelon, Nutrioso, East Clear Creek, and the LCR), except for Silver Creek where the fish is likely extirpated. Populations are generally small and the true population size for any occupied stream is unknown due to yearly fluctuations in their numbers and the difficulty of locating fish. Spinedace have disappeared from particular sampling sites for several years, but have reappeared later. The ephemeral nature of their occurrences makes management of the species difficult because we cannot measure population responses to changes within the watershed with certainty. However, all known populations have decreased since 1993 and drought conditions continue to put additional strain on these populations.

Previous Consultations

Federal actions affect the spinedace nearly every year and require formal section 7 consultation. Since 2010, there have been 10 biological opinions that have included the spinedace. A complete list of all consultations affecting this species is available on request.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present effects of all Federal, State, or private actions in the action area, the anticipated effects of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the effect 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 LCR is a principal tributary of the Colorado River, flowing north and northwest from its headwaters in eastern Apache County. Runoff typically peaks twice a year, first in spring (February–April) from snowmelt and rain at higher elevations, and again in summer (July–September) from monsoon storms. Only the upper and lowermost river reaches flow year-round.

Within the action area and construction footprint, the LCR is perennial with shallow, clear, slow-to-moderate moving waters over fine sand/gravel bottoms and rocks. The banks of the LCR have little vegetation hanging over the banks to provide aquatic species cover. Within the construction footprint, vegetation varies within four generalized topographic zones: the uplands, floodplain, lowlands, and riverbank. Drier upland areas and parts of the floodplain are dominated by grasses (mixed and short-grass species), forbs, and scattered shrubs. As the floodplain transitions into the lowlands, and soil moisture increases, horsetails *(Equisetum ferrissii*i) appear, along with sedges *(Carex praegracilis),* Parish's spikerush *(Eleocharis parishii*), other rushes (*Carex* spp.), and meadow fescue *(Schedonorus pratensis*rushes). In some lowland areas, moist soils give way to open-water marshes and sedges and rushes transition to monotypic stands of broadleaf cattail (*Typha latifolia*). These wetlands are supported by irrigated pasture lands that drain into ADOT's ROW south of the construction footprint. These wetlands are most evident between the bridge and Water Canyon Creek.

Wet lowlands and streambanks along the LCR are distinguished from adjacent uplands primarily by the presence of scattered, broadleaved trees such as Russian olive (*Elaeagnus angustifolia*), Goodding's willow (*Salix gooddingii*), an occasional cottonwood (*Populus* spp.), and juniper (*Juniperus* spp.). Nearly monotypic, dense stands of narrowleaf willow (*Salix exigua*), a shrubform of the genus, occurs at the bridge abutments.

Water Canyon Creek crosses the construction footprint and joins the LCR approximately 800 ft north of the bridge. It is seasonally wet, typically after monsoon storms. A stringer of mature Goodding's willow lines the drainage south of the highway. These trees are surrounded by cultivated fields and irrigated pastures, and have benefitted from the agricultural runoff. The line of willows extends from the culvert south about 0.15 mi. Trees north of the highway consist of a discontinuous line of Russian olive (10-15 trees) extending approximately 200 ft north from the culvert's outlet.

Status of the Spinedace in the Action Area

Spinedace records on the LCR mainstem between Springerville and St. Johns extend back to the 1990's (Dorum and Young 1995). The spinedace is common at Winema and Becker Wildlife Areas (WAs), both of which are within 6 river mi of the action area (Becker Lake is just 3.5 mi downstream of the LCR bridge) (Natural Channel Design, Inc. 2010, AGFD 2018, USFWS 2008, 2018). Other sites in the general area with known spinedace populations include Nutrioso Creek and Rudd Creek; however, these sites are 20 or more river mi from the action area.

Based on AGFD fish sampling on the LCR in 2009, AGFD considers the spinedace to be absent from reaches of the LCR above a water diversion structure just downstream of Airport Road in Springerville (M. Lopez, AGFD fish biologist, personal communication, March 26, 2019). The diversion structure is 2.75 mi downstream of the LCR bridge. The 2009 surveys documented spinedace at several locations downstream of the diversion structure, but spinedace were not detected upstream of this structure. Surveys in 2009 included sampling at the LCR bridge. The last known detection of spinedace at the bridge was in 1991 (AGFD 2018).

In spite of the 2009 survey results, FWS considers it possible that spinedace currently occupy the action area. First, spinedace are common in nearby downstream reaches of the LCR (Winema and Becker WAs). Second, data from 2009 may be outdated with respect to spinedace distribution. Spinedace are able to recolonize new or former stream reaches during wetter periods, and this ability to colonize an area quickly is noted in the literature (Minckley and Carufel 1967) and by personal observations of others familiar with the species. Populations seem to appear and disappear over short time frames and this has made specific determinations on status and exact location of populations difficult. Both researchers and managers have observed this unpredictability (e.g., Miller 1963, Minckley 1973). We note that the Upper Little Colorado River regularly experiences flash floods, often several per year, which could provide opportunities for spinedace to breach the diversion structure at Airport Road and move into upstream reaches. The 78-year average for flows at the nearest stream gauge located about 17 mi downstream of the action area (USGS Stream Gauge Number 09384000) is 75 cubic ft per second (cfs). From 2009, when spinedace surveys last occurred on the LCR main stem, to the present, flows at that gauge exceeded 400 cfs seven times, and exceeded 700 cfs three times. The highest flows so far in 2019 exceeded 450 cfs in April.

Factors Affecting Spinedace in the Action Area

LCR flow and physical attributes have been affected by watershed and floodplain land use changes, dams and water diversions, instream gravel mining, and past and present cattle grazing practices (USFWS 2008). However, at present and throughout most of its range, the spinedace is most vulnerable to predation by and competition from non-native aquatic species including introduced nonnative fish and crayfish. AGFD fish sampling in 2009 documented the following nonnative fish species at the LCR bridge: brown trout, rainbow trout, and fathead minnow. As we discussed in the previous section, the diversion structure below Airport Road in Springerville may limit upstream movements by spinedace during normal flows in the LCR; however, the effects of the structure on movements during peak flows are not clear.

Past Projects in the Action Area

A review of past or concurrent section 7 consultations found one previous project that occurred in the action area, the Wallow Fire Flood Protection Project at the SR 260 and SR 261 bridges on the LCR (consultation number 22410-2011-IE-0324). This informal emergency project anticipated flood scour effects to the SR 260 and SR 261 bridges by adding clean riprap material around bridge abutments. Various riparian habitat, stream, and fish enhancement projects that have occurred nearby, but outside of the action area, include the Fish Barrier Maintenance Project on the West Fork of the LCR (02EAAZ00-2015-SLI-0525); Upper Little Colorado River Riparian Enhancement Demonstration Project (22410-2001-F-0218); Little Colorado River and Nutrioso Creek Riparian Enhancement Project (22410-2008-F-0332); Wilkins Family Little Colorado River Restoration Project (22410-2006-F-0222); Wenima Wildlife Area Stream Restoration Project (22410-2010-F-0584); and X Diamond Ranch Riparian Restoration and Enhancement Project (22410-2006-F-0464).

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 that 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 caused by the proposed action and are later in time, but are still reasonably certain to occur.

Little Colorado spinedace may occur in the action area when work on the LCR bridge begins in the spring of 2019. Suitable spinedace habitat is present in the construction footprint, in the action area, and upstream and downstream of the action area. Spinedace populations occur on the LCR's main stem within a few miles of the LCR bridge and in nearby tributaries (e.g., Nutrioso Creek, which joins the main stem three mi downstream of the LCR bridge), and have the ability to expand into areas following increased flows.

Spinedace Capture, Translocation, and Dewatering

Before dewatering, qualified biologists will capture and relocate native fish and frogs out of the construction footprint to the extent possible, but if any spinedace remain at the site, they are likely to be injured or killed. Efforts to capture spinedace and other aquatic wildlife will continue during dewatering, but fish removal is not expected to be 100 percent effective because small fish, including spinedace, may hide in underbank areas, in rocks, or in aquatic vegetation and be missed during removal. Spinedace that are not removed are likely to be killed because of dewatering, or consumed by aquatic predators while being confined to isolated shallow pools. However, provisions outlined in the fish salvage protocol will minimize spinedace injuries or fatalities during construction. In addition, based on the 2009 survey data, we expect that if spinedace occur at the site, they are likely to be present in relatively low numbers.

Streambed and Vegetation Effects

Installing concrete scour protection under the SR 260 bridge will permanently alter 0.07 ac of streambed which currently serves as spinedace habitat. However, alteration of such a small part of the LCR watershed at the SR 260 bridge footprint will be insignificant for spinedace and its habitat needs.

Access to the streambed below the SR 260 bridge will require grading and construction of two access roads into the work area at the bridge. Construction of the water diversion channels, scour protection floor, and pier repairs, will require heavy equipment and work crews to operate along the streambanks and within the stream channel. Vegetation along the channel, including dense stands of narrowleaf willow growing on the existing gabions at the bridge abutments, and aquatic vegetation in the channel, will be removed or will die as a result of dewatering. Stands of willow will be removed permanently from the abutments so that shotcrete can be applied to the bridge abutments. These activities will eliminate shade and escape cover for the spinedace after water barriers are removed; however, except for the willow stands at the abutments, streamside and aquatic vegetation will regenerate quickly; thus, effects of vegetation removal to the spinedace and its habitat will be temporary, small in size, and therefore will be insignificant.

Water Quality Effects

Conservation measures and BMPs involving spill and storm water protection plans are expected to prevent or minimize effects to stream water quality from materials used during pier repairs, scour floor construction, and shotcrete bridge abutment protection. Under optimal (i.e., dry) conditions, any impacts to water quality due to chemical releases are likely to be minimal or nonexistent. Unforeseen large storm events that result in surface flows through the action area during construction or an accidental spill of a contaminant material, such as concrete, concrete curing agents and sealers, vehicle lubricants, and other chemicals, have the potential to adversely affect water quality. A Clean Water Act Section 404 permit will be required for the project and will include provisions for immediate cleanup of any substance in case of a leakage or spill, and will describe treatment for each substance. Due to BMPs and conservation measures, 404 permit standards, and project timing, we expect any water quality effects to spinedace and its habitat will be insignificant and discountable.

Due to implementation of conservation measures, which include following FWS guidance (White 2007) and label requirements, we expect any effects to spinedace or spinedace habitat from herbicide application will be discountable. Buffers and application methods will prevent adverse effects to fish and water quality. All herbicides within 200 feet of the ordinary high water mark will be applied by hand, with a relatively coarse spray, to insure direct application to plants and to prevent overspray.

Erosion and Sedimentation Effects

ADOT road construction standards and BMPs will minimize erosion and transport of sediments into the LCR during and after construction (ADOT 2008, 2012). Erosion and turbidity will increase during construction as a result of heavy equipment movements into and out of the LCR channel and excavation of water diversion channels. Diversion channels will be narrower than

the natural low-flow channel and flow velocities, amount of scouring, and sediment transport through the diversion channels and into the LCR will increase accordingly. Increased turbidity may result in channel substrate embeddedness (excessive fines deposited on larger gravels and cobbles) in spinedace spawning areas downstream of the LCR bridge. Increased sedimentation downstream of the LCR bridge is likely to continue after construction due to loss of vegetation from the LCR's streambanks during construction.

Construction standards and BMPs will help to reduce erosion and downstream sedimentation effects to spinedace in several ways. First, sediment flows during the project will be reduced to the extent possible by construction of a temporary sediment basin, use of sediment fences, and/or other control measures. Second, recontouring the LCR's streambanks and streambed and reseeding disturbed areas with native plants, will promote post-construction vegetation growth and recovery. With regard to substrate embedding, restoration of flows after diversion channels are removed will return the natural movement of gravel and silt through the construction footprint. Given that erosion control measures are fully implemented, erosion and sedimentation effects downstream of the construction footprint will be minimized and localized, will be temporary, and will cause insignificant adverse effects to spinedace and its habitat.

CUMULATIVE EFFECTS

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

Lands in the project area are privately-owned and are either undeveloped or are developed for agriculture. Although we know of no specific development plans on private lands in the action area, it is reasonable that additional developments may occur in the future.

JEOPARDY ANALYSIS

Jeopardy Analysis Framework

Our jeopardy analysis relies on the following:

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species' survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The

jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

CONCLUSIONS

After reviewing the current status of the Little Colorado spinedace, the environmental baseline for the action area, the effects of the proposed scour retrofit of the SR 260 bridge, and the cumulative effects, it is our biological opinion that construction activities at the bridge as proposed are not likely to jeopardize the continued existence of the Little Colorado spinedace.

We base our determination on the following rationale:

1) Fish salvage and relocation efforts, and conservation measures included in the proposed action, will conserve as many spinedace as possible, minimizing the number of spinedace killed or injured during construction.

2) The scour retrofit will not result in permanent changes to water flows under the bridge; thus, the project will not result in permanent effects to aquatic habitat.

3) Construction of the scour protection floor will permanently alter approximately 0.11 ac of the streambed within the construction footprint; however, loss of this small amount of stream substrate will not prevent spinedace from using this area in the future.

4) Effects to spinedace and its habitat downstream of the construction footprint from sedimentation or streambed embeddedness will be temporary and herbicide effects are expected to be discountable.

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

INCIDENTAL TAKE STATEMENT

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

provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

We anticipate that the proposed action is reasonably certain to result in incidental take of Little Colorado spinedace. This incidental take is expected to be in the forms of harm (direct fatality or injury) and harassment resulting from the effects of the proposed action on the spinedace and dewatering of habitat

We cannot quantify the number of individual spinedace that will escape capture and die during dewatering of the work area because most individuals that are not captured during salvaging operations will be almost impossible to find or may be consumed by predators. Thus, we anticipate take in the form of injury or death of all spinedace that are not captured (i.e., that are missed) at the LCR bridge construction site. Because we anticipate any remaining spinedace in the area to be dewatered will die or be injured within the construction footprint, the project cannot exceed this incidental take as long as the project effects are contained within the action area. If monitoring indicates that fish died or are injured because of the proposed action beyond the construction footprint (e.g., contamination), then incidental take will be exceeded.

EFFECT OF THE TAKE

In the accompanying biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the Little Colorado spinedace.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measure is necessary and appropriate to minimize take of spinedace:

1. ADOT will monitor incidental take resulting from the proposed action and report its findings to the FWS

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, ADOT must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure #1 for spinedace:

1.1 ADOT will work with AGFD and the FWS to designate a permitted, and qualified fish biologist to monitor activities in the construction footprint and action area and to ascertain incidental take of spinedace. This monitoring will be accomplished by the biologists who implement the fish salvage protocol.

Biologists will move all native fish species captured during dewatering of work areas downstream of the construction footprint as provided for in the aquatic species salvage protocol summarized in this BO. Biologists will record the number of each species captured and moved.

1.2 ADOT will submit a report of the salvage and monitoring effort to the Arizona Ecological Services Field Office within 90 days after completion of work at the LCR bridge. This report will briefly document the implementation of the conservation measures; report on the number of spinedace and native fish encountered, collected, and moved downstream; and document any spinedace fatalities that occur.

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 will 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 conservation recommendations for the proposed action.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate the ADOT's efforts to identify and minimize effects to listed species from this project. For further information, please contact Robert Lehman (602) 889-5950 or Greg Beatty (602) 889-5941. Please refer to the consultation number 02EAAZ00-2015-F-0270 in future correspondence concerning this project.

Sincerely,

Greg Beatty for JAH

Jeffrey A. Humphrey
Field Supervisor

cc: (electronic)
Fish and Wildlife Biologists, Fish and Wildlife Service, Phoenix, AZ (Attn: S. Hedwall, G. Beatty, R. Gordon)

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Supervisor, Region 1, Arizona Game and Fish Department, Pinetop, AZ
Wildlife Biologists, ADOT, Phoenix, Flagstaff, AZ (Attn: K. Gade, J. White, A. Navarro)
Environmental Coordinator, Bureau of Indian Affairs, Phoenix, AZ (Attn: Chip Lewis)
Director, Cultural Resource Enterprise, Pueblo of Zuni, Zuni, NM
Director, Cultural Resources, White Mountain Apache Tribe, White River, AZ
Executive Director, Inter-Tribal Council of Arizona.

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APPENDIX A: CONCURRENCES AND FIGURES

This appendix contains our concurrences with your determinations that the proposed action "may affect, but is not likely to adversely affect" the endangered southwestern willow flycatcher and endangered New Mexico meadow jumping mouse, and Figure 1.

Southwestern Willow Flycatcher

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:

- No flycatcher surveys were done specifically for this project and none are known to have recently occurred in the action area (G. Beatty, USFWS Wildlife Biologist, personal communication, November 28, 2016); however, riparian vegetation in the construction footprint is not suitable for breeding flycatchers. Thus, the likelihood of direct or indirect effects to breeding flycatchers will be discountable.
- In the event that migrant flycatchers pass through the action area during construction, they would likely avoid the construction footprint and move on to unaffected nearby areas; thus, effects to migrant flycatchers will be insignificant.

New Mexico Meadow Jumping Mouse

FWS species status assessments for the jumping mouse (USFWS 2014, 2018) indicate that mouse populations in Arizona are isolated and widely separated, and that the LCR bridge is separated from nearby mouse populations by distances from 8-17 or more mi and by physical and biological barriers, including Nelson Reservoir on Nutrioso Creek, a tributary of the LCR, and agricultural developments that surround the LCR bridge.

In 2018, ADOT conducted jumping mouse protocol surveys in the LCR bridge construction footprint in cooperation with AGFD (ADOT 2018). ADOT surveys confirmed the presence of suitable jumping mouse habitat at the LCR bridge (vegetation dominated by a grasses, forbs, sedges, and bulrushes), but no jumping mouse captures occurred during the surveys.

Conservation Measures

- Prior to initiation of construction activities, all personnel who will be on-site, including but not limited to, the contractor, contractors' employees, supervisors, inspectors, and subcontractors will review ADOT's environmental planning pamphlet entitled *Identifying the New Mexican Meadow Jumping Mouse*.

Determination of Effects

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the New Mexico meadow jumping mouse for the following reason:

- Given the long distances between the bridge and known mouse populations, identified barriers to mouse movements in the action area and local drainages, and that jumping mice were not found in the construction footprint, is unlikely that jumping mice currently occupy the construction footprint or action area; therefore, the likelihood of direct or indirect adverse effects on the mouse from this project is discountable.
- Vegetation disturbed in the construction footprint will be rehabilitated after construction; thus, any effects to jumping mouse habitat will be temporary, and therefore, insignificant.

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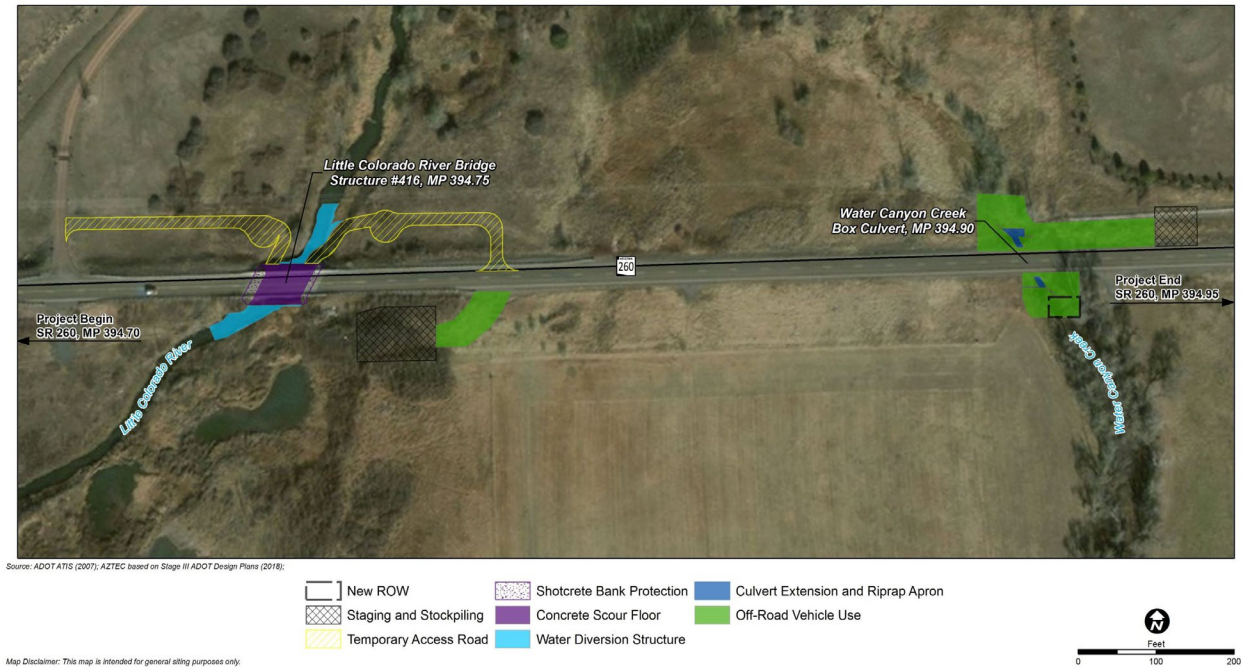

Figure 1. Access routes, staging areas, ORV-use areas, water diversion structures, and the scour protection floor for the State Route 260 Bridge Project on the Little Colorado River, Apache County, Arizona.