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AESO/SE
2-21-98-F-403R1 July 24, 2002

Mr. Robert Hollis, Division Administrator
U.S. Department of Transportation
Federal Highway Administration
One Arizona Center-Suite 410
400 East Van Buren Street
Phoenix, Arizona 85004-2285

RE: Re-initiation of Biological Opinion for State Route 260, Cottonwood Through Camp Verde, Verde River Bridge, Segment II Project in Yavapai County

Dear Mr. Hollis:

This biological opinion responds to your request for re-initiation of 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 for re-initiation of formal consultation (project #2-21-98-F-403) was dated April 18, 2002, and received by us on April 23, 2002. This opinion addresses impacts that may result from the proposed State Route 260, Cottonwood through Camp Verde, Verde River Bridge, Segment II project in Yavapai County, Arizona.

Your April 18, 2002, request for re-initiation of formal section 7 consultation resulted from the designation of critical habitat for the threatened spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*). Designation of critical habitat is one of the criteria for re-initiation of formal consultation. You made the determination of "may affect, likely to adversely affect for loach minnow, spikedace, and designated critical habitat for both of these fish species.

To clarify, you have removed the additional conservation measure for the endangered southwestern willow flycatcher (*Empidonax trailli extimus*), that was proposed in your April 18, 2002 request for re-initiation of formal consultation. You are not re-initiating consultation on southwestern willow flycatcher.

We determined in the original consultation that the project would not jeopardize the razorback sucker (*Xyrauchen texanus*), nor adversely modify its critical habitat. You indicated in your

April 18, 2002, Biological Assessment that proposed measures to reduce and minimize take and Reasonable and Prudent Measures (RPM) established in the opinion for the razorback sucker will be carried out. There is no additional information that would require re-evaluating the project's effects to razorback sucker or designated razorback sucker critical habitat.

This biological opinion is based on information provided in the April 18, 2002, biological assessment, and the previously completed March 5, 1999, biological opinion, including the administrative record upon which that opinion is based. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

September 1998 - The Federal Highway Administration (FHWA) requested initiation of formal consultation.

October 1998 - We acknowledged receipt of formal initiation letter and concurred with FHWA's determination of "not likely to adversely affect loach minnows.

March 1999 - We completed a biological opinion for razorback sucker and southwestern willow flycatcher.

April 2000 - We designated critical habitat for the threatened spikedace and loach minnow. The proposed project occurs within the Verde River segment of critical habitat (Complex 1) that extends from Granite Creek downstream to Fossil Creek.

April 18, 2002 - FHWA requested re-initiation of consultation to address critical habitat for spikedace and loach minnow. FHWA requested an expedited consultation.

April 30, 2002 - We acknowledged receipt of FHWA's request for consultation and desire to complete the biological opinion as quickly as possible.

July 22, 2002 - We sent FHWA a draft biological opinion for review. Steve Thomas (FHWA) and Robert Forrest (ADOT) called on July 24th to say they had no changes to the draft biological opinion and that the final should be sent.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed project is the widening of State Route (SR) 260 from Cottonwood to east of Camp Verde. The expansion will provide the capacity needed to accommodate the 2015 design year projected traffic volumes, and provide an adequate level of transportation service along the route over the next 20 years. Route 260 serves as the main commercial route between I-17 and the

City of Cottonwood to the west and the Town of Camp Verde to the east. This roadway also serves as the primary route to recreational opportunities in the greater Verde Valley area and the Mogollon Rim.

The action area encompasses the Verde River and the 100-year floodplain through the Verde Valley (including the towns of Clarkdale, Cottonwood, and Camp Verde) from Tapco down to Beasley Flat (a 46 mile stretch of river). While construction is focused at the bridge, our area of analysis encompasses a larger area due to possible upstream and downstream effects to the stream channel and the increase recreation and urbanization the development of the bridge is facilitating (Map 1 and 2).

The Arizona Department of Transportation (ADOT), with funding from FHWA, is planning to build an additional bridge over the Verde River in conjunction with the widening of SR 260. The bridge is located near the southern end of the Town of Camp Verde. The existing bridge at the Verde River crossing consists of three piers, four spans, and is 650 feet long. The design of the existing bridge (post-tensioned box girder) does not permit widening. The additional bridge crossing proposed will be constructed three feet upstream of the existing bridge. The new bridge will have similar dimensions and construction to the existing bridge over the Verde River. A concrete slab in the middle of the 6- to 8-foot wide raised median will cover the space between the two structures. The three piers will be constructed outside of the active river channel. A temporary road and drill pads will be constructed with hand-placed sandbags, a fabric liner, and clean fill. No vehicle crossings of the Verde River are permitted. Vehicle access to the riverbed will be provided from both sides of the river channel. The current structure will be used for eastbound traffic, while the new structure will be for westbound traffic.

The proposed bridge construction will require activities to occur within the Verde River riverbed, both above and below the ordinary high water mark, and adjacent to the active channel. These proposed activities include constructing access routes to each of the bridge pier locations, constructing a temporary crane pad at each pier, drilling for bridge pier foundations, placing concrete for the piers, and constructing the bridge. A drilling rig will be positioned on the temporary drill pad, and will then drill through the pad to create the pier shafts. Drill pads will be large enough to contain machinery and any excavated materials generated during the drilling activities. These berms will be covered with clean-fill sand bags to reduce erosion and siltation. All excavated material will be removed from the vicinity of the live stream and will be used for highway embankment/grading outside of the waters of the U.S. Excavated soil materials generated by the drilling operations will be temporarily placed in the riverbed outside the waters of the U.S. and then removed in a systematic manner from the site. In order to access the work area, temporary access routes will be established in previously disturbed locations from the north and south banks. Construction activities will not occur within the active channel. Riverbed alterations will be temporary, and will be returned to pre-construction baseline conditions (as much as possible) when construction in the riverbed is complete.

Disturbance within waters of the U.S. will be limited to the proposed limits of work (see Biological Assessment, Sverdrup 1998). All vegetation and excess material will be removed along the entire length of the access road and drill pads, and as required to prepare the work area.

Excess water will be removed from the shafts and foundation using conventional dewatering equipment. After dewatering and completion of the bridge, basin liner materials will be removed, and all disturbed areas will be re-graded to pre-construction conditions.

Approximately 369 cubic yards of concrete will be placed in waters of the U.S. to construct the pier footings. Approximately 3,592 cubic yards of on-site soil used to construct the temporary crane pads will be excavated from within the approved bridge construction limits outside of waters of the U.S. No earthen materials will be permanently excavated or deposited in waters of the U.S., since the excavation and re-grading of the basins will occur outside of the jurisdictional limits of the Verde River. No asphalt or construction waste materials of any kind will be included in the fill.

Less than 0.02 acres of waters of the U.S. will be permanently affected by the bridge construction; approximately 0.22 acres of temporary disturbance will occur in waters of the U.S., within the designated access routes. No waters of the U.S. will be permanently affected by the dewatering activities; temporary disturbance will occur outside of waters of the U.S. to create and re-grade the basins, if needed. Minimal incursions into the Verde River will take place during construction beyond that identified herein to construct and remove the drill pads. The new bridge span over the Verde River will be installed from the existing bridge.

Roads located at the bridge (existing and future structure) will be used for construction and maintenance, and also provide for existing uses in the area. During construction, the existing northeast and southeast access locations at the bridge will be used to access the Verde River floodplain for construction of the abutments and piers. To accommodate access for ADOT maintenance and inspection needs, a new access road on the northwest side of SR 260 will be provided. This access will be fenced and gated. The current access at the southeast quadrant of the Verde River Bridge will be shifted to the east to accommodate the new SR 260 westbound construction.

Construction of the bridge over the Verde River is anticipated to take approximately one year to complete. It will require two to three months within the riverbed to build the foundations and the three piers. An additional week will be required to install the girders from the existing structure to the new structure. All work to be conducted with the Verde River riverbed will be restricted to September 15 to January 30, which is after the southwestern willow flycatcher and yellow-billed cuckoo breeding seasons, and prior to the razorback sucker breeding season.

Conservation Measures

Conservation measures, as proposed by FHWA and ADOT, Reasonable and Prudent Measures described in the original Biological Opinion for State Route 260, Cottonwood through Camp Verde, Yavapai County (2-21-98-F-403) (USFWS 1999), Best Management Practices (BMP), and specific precautionary measures to be determined by the U.S. Army Corps of Engineers and the Arizona Department of Environmental Quality 401 certification will be implemented to avoid increased sedimentation or other impacts to water quality, such as preventing debris from inadvertently getting into the Verde River. The location of the new bridge also minimizes impacts to vegetation. No substantial impact to water movement is anticipated with regard to the

construction of the new Verde River Bridge. Water flow will be maintained during construction. The drill pads will be removed after construction is completed, and the floodplain will be returned to pre-construction contours (as much as possible).

Conservation Measures proposed by FHWA/ADOT in March 1999 USFWS Biological Opinion

1. FHWA and ADOT have agreed that all construction work in the upland areas immediately adjacent to the Verde River will be conducted in a manner that precludes any short or long-term sediment loading of the stream. Specific precautionary measures such progressive seeding will be included in the construction contract's special provision in addition to standard best management practices.

2. FHWA and ADOT have agreed that water needed for construction purposes (e.g. dust palliative) will not be drawn from the Verde River. ADOT has agreed to confirm that there will be ample construction water available from the Forest Service or municipal sources.

3. FHWA and ADOT have agreed that the bridge falsework will not be permitted in the low flow channel of the Verde River at any time. During the February 1 to May 31 razorback sucker breeding season, falsework will not be permitted in any portion of the riverbed. If used outside of the breeding season, the installation and removal of bridge falsework landward of the low flow channel will incorporate BMPs to minimize silt loading in the live stream. No use of, or crossing by heavy machinery will occur within the wetted channel (live stream).

4. FHWA and ADOT have agreed that bridge superstructure work will be permitted during the razorback sucker breeding season provided that the work is not performed in the streambeds, and the river is adequately protected from debris falling into the river from construction activities.

5. FHWA and ADOT have agreed that the construction contractor will provide a qualified fish monitor to determine if fish kills result from construction activities in or adjacent to (approximately 100 yards) flowing water unless the activity has no potential to directly or indirectly result in discharge into the stream. Monitoring activities will be conducted at minimum distance of 0.5 miles upstream and 0.5 miles downstream of the construction areas in the vicinity of the Verde River bridge crossing. If fish mortality reaches more than 20 specimens per event, FWS shall be immediately notified (602-242-0210; 602-242-2513 FAX) of the incident.

STATUS OF THE SPECIES

Formal consultation has documented various effects from Federal actions to spikedace and loach minnow which contribute to the status of the species on the Verde River (Appendix 1). Some of these actions contained components that lessened adverse effects of ongoing actions or were

aimed at improving watershed conditions (livestock grazing management changes, etc.). Although take was authorized in many instances, actions to reduce and minimize take through reasonable and prudent measures were implemented.

Spikedace

Spikedace was listed as a threatened species on July 1, 1986 (USFWS 1986a). Critical habitat was designated for spikedace on March 8, 1994 (USFWS 1994a), but was set aside by order of the Federal courts in Catron County Board of Commissioners, New Mexico v. U.S. Fish and Wildlife Service, CIV No. 93-730 HB (D.N.M., Order of October 13, 1994). It was again designated on April 25, 2000 (USFWS 2000). Critical habitat includes portions of the Verde, middle Gila, San Pedro, San Francisco, Blue, and upper Gila rivers and Eagle, Bonita, Tonto, and Aravaipa creeks and several tributaries of those streams.

Spikedace is a small silvery fish whose common name alludes to the well-developed spine in the dorsal fin (Minckley 1973). Spikedace historically occurred throughout the mid-elevations of the Gila River drainage, but is currently known only from the upper Verde, middle Gila, and upper Gila rivers, and Aravaipa and Eagle creeks (Barber and Minckley 1966, Minckley 1973, Anderson 1978, Marsh *et al*. 1990, Sublette *et al*. 1990, Jakle 1992, Knowles 1994, Rinne 1999). Spikedace likely occurs on the upper Verde River, but has not been detected since 1999 (AGFD 1999). Habitat destruction along with competition and predation from introduced nonnative species are the primary causes of the species' decline (Miller 1961, Williams *et al*. 1985, Douglas *et al*. 1994).

Spikedace live in flowing water with slow to moderate velocities over sand, gravel, and cobble substrates (Propst *et al*. 1986, Rinne and Kroeger 1988). Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at the downstream riffle edges (Propst *et al*. 1986). Spikedace spawns from March through May with some yearly and geographic variation (Barber *et al*. 1970, Anderson 1978, Propst *et al*. 1986). Actual spawning has not been observed in the wild, but spawning behavior and captive studies indicate eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace live about two years with reproduction occurring primarily in one-year old fish (Barber *et al*. 1970, Anderson 1978, Propst *et al*. 1986). It feeds primarily on aquatic and terrestrial insects (Schreiber 1978, Barber and Minckley 1983, Marsh *et al*. 1989).

Constituent elements of critical habitat include those habitat features required for the physiological, behavioral, and ecological needs of the species. For spikedace, these include:

1. Permanent, flowing, unpolluted water;

2. Living areas for adult spikedace with slow to swift flow velocities in shallow water with shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand and gravel bars, and eddies at downstream riffle edges;

3. Living areas for juvenile spikedace with slow to moderate flow velocities in shallow water with moderate amounts of instream cover;

4. Living areas for larval spikedace with slow to moderate flow velocities in shallow water with abundant instream cover;

5. Sand, gravel, and cobble substrates with low to moderate amounts of fine sediment and substrate embeddedness;

6. Pool, riffle, run, and backwater components present;

7. Low stream gradient;

8. Water temperatures in the approximate range of 35-85°F with natural diurnal and seasonal variation;

9. Abundant aquatic macroinvertebrate food base [prey may include the taxa Ephemeroptera, Chironomidae, and Trichoptera (Sublette *et al.*1990)];

10. Periodic natural flooding;

11. A natural, unregulated hydrograph or, if the flows are modified or regulated; then a hydrograph that demonstrates an ability to support a native fish community; and

12. Habitat devoid of nonnative aquatic species detrimental to spikedace, or habitat in which detrimental nonnative species are at levels which allow persistence of spikedace.

The constituent elements are generalized descriptions and ranges of selected habitat factors that are critical for the survival and recovery of spikedace. The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the constituent elements must include consideration of the season of concern and the characteristics of the specific location. The constituent elements are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the constituent elements need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrologic patterns, and overall aquatic faunal community structure.

Recent taxonomic and genetic work on spikedace indicate there are substantial differences in morphology and genetic makeup between remnant spikedace populations. Remnant populations occupy isolated fragments of the Gila basin and are isolated from each other. Anderson and Hendrickson (1994) found that spikedace from Aravaipa Creek are morphologically distinguishable from spikedace from the Verde River, while spikedace from the upper Gila River

and Eagle Creek have intermediate measurements and partially overlap the Aravaipa and Verde populations. Mitochondrial DNA and allozyme analyses have found similar patterns of geographic variation within the species (Tibbets 1992, Tibbets 1993).

The status of spikedace is declining rangewide. Although it is currently listed as threatened, we have found that a petition to uplist the species to endangered status is warranted. A reclassification proposal is pending; however, work on it is precluded due to work on other higher priority listing actions (USFWS 1994a).

Loach Minnow

Loach minnow was listed as a threatened species on October 28, 1986 (USFWS 1986b). Critical habitat was designated for loach minnow on March 8, 1994 (USFWS 1994b), but was set aside by order of the Federal courts in Catron County Board of Commissioners, New Mexico v. U.S. Fish and Wildlife Service, CIV No. 93-730 HB (D.N.M., Order of October 13, 1994). It was again designated on April 25, 2000 (USFWS 2000). Critical habitat includes portions of the Verde, Black, middle Gila, San Pedro, San Francisco, Tularosa, Blue, and upper Gila rivers and Eagle, Bonita, Tonto, and Aravaipa creeks, and several tributaries of those streams.

Loach minnow is a small, slender, elongate fish with markedly upwardly-directed eyes (Minckley 1973). Historic range of loach minnow included the basins of the Verde, Salt, San Pedro, San Francisco, and Gila rivers (Minckley 1973, Sublette *et al.* 1990). Habitat destruction plus competition and predation by nonnative species have reduced the range of the species by about 85 percent (Miller 1961, Williams *et al*. 1985, Marsh *et al*. 1989). Loach minnow remains in limited portions of the upper Gila, San Francisco, Blue, Black, Tularosa, and White rivers and Aravaipa, Turkey, Deer, Eagle, Campbell Blue, Dry Blue, Pace, Frieborn, Negrito, Whitewater and Coyote creeks in Arizona and New Mexico (Barber and Minckley 1966, Silvey and Thompson 1978, Propst *et al*. 1985, Propst *et al*. 1988, Marsh *et al*. 1990, Bagley *et al*. 1995, USBLM 1995, Bagley *et al*. 1996, Miller 1998).

Loach minnow is a bottom-dwelling inhabitant of shallow, swift water over gravel, cobble, and rubble substrates (Rinne 1989, Propst and Bestgen 1991). Loach minnow uses the spaces between, and in the lee of, larger substrate for resting and spawning (Propst *et al*. 1988; Rinne 1989). It is rare or absent from habitats where fine sediments fill the interstitial spaces (Propst and Bestgen 1991). Some studies have indicated that the presence of filamentous algae may be an important component of loach minnow habitat (Barber and Minckley 1966). Loach minnow feeds exclusively on aquatic insects (Schrieber 1978, Abarca 1987). Spawning occurs in March through May (Britt 1982, Propst *et al*. 1988); however, under certain circumstances loach minnow also spawn in the autumn (Vives and Minckley 1990). The eggs of loach minnow are attached to the underside of a rock that forms the roof of a small cavity in the substrate on the downstream side. Limited data indicate that the male loach minnow may guard the nest during incubation (Propst *et al*. 1988, Vives and Minckley 1990).

The primary constituent elements for loach minnow critical habitat include:

1. Permanent, flowing, unpolluted water;

2. Living areas for adult loach minnows with moderate to swift flow velocities in shallow water with gravel, cobble, and rubble substrates;

3. Living areas for juvenile loach minnows with moderate to swift flow velocities in shallow water with gravel, cobble, and rubble substrates;

4. Living areas for larval loach minnows with slow to moderate flow velocities in shallow water with sand, gravel, and cobble substrates and abundant instream cover;

5. Spawning areas for loach minnow with slow to swift flow velocities in shallow water with uncemented cobble and rubble substrate;

6. Low amounts of fine sediment and substrate embeddedness;

7. Pool, riffle, run, and backwater components present;

8. Low to moderate stream gradient;

9. Water temperatures in the approximate range of 35-85°F with natural diurnal and seasonal variation;

10. Abundant aquatic macroinvertebrate food base [prey may include chironomids, simuliids, ephemeropterans, plecopterans, and tricopterans and juvenile loach minnows generally take chironomids (Sublette *et al.* 1990)];

11. Periodic natural flooding;

12. A natural, unregulated hydrograph or, if the flows are modified or regulated; then a hydrograph that demonstrates an ability to support a native fish community; and

13. Habitat devoid of nonnative aquatic species detrimental to loach minnow, or habitat in which detrimental nonnative species are at levels which allow persistence of loach minnow.

These constituent elements are generalized descriptions and ranges of selected habitat factors that are critical for the survival and recovery of loach minnow.

As noted under spikedace, the appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the constituent elements must include consideration of the

season of concern and the characteristics of the specific location. The constituent elements are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the constituent elements need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrologic patterns, and overall aquatic faunal community structure.

Recent biochemical genetic work on loach minnow indicate that there are substantial differences in genetic makeup between remnant loach minnow populations (Tibbets 1993). Remnant populations occupy isolated fragments of the Gila River basin and are isolated from each other. Based upon her work, Tibbets (1992, 1993) recommended that the genetically distinctive units of loach minnow should be managed as separate units to preserve the existing genetic variation.

The status of loach minnow is declining rangewide. Although it is currently listed as threatened, we have found that a petition to uplist the species to endangered status is warranted. A reclassification proposal is pending, however; work on it is precluded due to work on other higher priority listing actions (USFWS 1994c).

Critical Habitat

The Verde River complex, which is comprised of the Verde River in conjunction with its main tributaries, has been segregated into six distinct geographical units based upon relative proximity to a major tributary or the Verde River itself. Critical habitat includes 106 miles of the Verde River, extending from Sullivan Dam downstream to the confluence with Fossil Creek.

Critical habitat has also been designated in 5th code watersheds, specifically in major tributaries to the Verde River. These tributaries include Fossil Creek (5 miles), West Clear Creek (7 miles), Beaver/Wet Beaver Creek (21 miles), Oak Creek (34 miles), and Granite Creek (1.4 miles). The tributary streams within the Verde River complex are believed to be unoccupied at the present time although they offer potential habitat for spikedace and loach minnow (USFWS 2000).

The relatively stable hydrologic and thermal regimes of the Verde River complex are unique compared to other river systems of the arid southwestern United States (USFWS 2000). The combination of these factors provides a promising prospect of future recovery efforts for these species within the unoccupied reaches in the Verde River complex.

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 to provide a platform from which to assess the effects of the action now under consultation.

The Verde Valley is characterized by a wide flood basin once dominated by Fremont cottonwoods. Although mature cottonwood stands persist, dense understory is largely absent and the contiguous habitat is now fragmented (Paxton et al. 1997). The quality and quantity of suitable aquatic habitat for threatened and endangered fish in the Verde Valley have been affected through numerous past actions resulting in reduction of riparian habitat, altered species composition, increased presence of exotic fish, decreased surface water availability, changes in stream morphology, and other factors. A significant portion of the adverse impacts to the Verde River and its aquatic and riparian ecosystem come from the additive effect of small actions that individually may not threaten the system, but cumulatively result in continuing deterioration of the ecosystem.

Habitat for threatened and endangered fish in the Verde River has undergone major changes in the past 150 years, with the Verde Valley being the most highly modified (excluding Horseshoe and Bartlett lakes). The volume and pattern of flow in the river, particularly within the Verde Valley, has been modified by water diversion, groundwater pumping, and watershed alteration. The river channel has been modified by removal or use of riparian vegetation, flood control, construction of diversion dams, roads and bridges, gravel mining, and agricultural/suburban development of the floodplain. Additionally, various non-native fish have been and continue to be introduced into the Verde River system that have adversely affected threatened and endangered and other native fish through predation and competition (Marsh and Brooks 1989, Minckley et al. 1991, Hendrickson 1993, Rinne 1999).

Human disturbances of the watershed, floodplain, and stream channel change many of the factors determining channel configuration. Increased sediment off the watershed is a common result of human actions and sediment is a major determinant of channel shape (Leopold 1997). When the dynamic equilibrium has been disrupted, the channel begins a process of adjustment as it attempts to restore a dimension, pattern, and profile that are consistent with controlling hydraulic variables (Rosgen 1996). These adjustments may lead to dramatic changes in the stream channel width, depth, and geometry that encroach on human activities, such as has occurred on the Verde River. As human activities are affected, additional flood control and channelization measures may occur, which exacerbate the problems in adjacent areas (Pearthree and Baker 1987), and the channel will continue to become increasingly unstable.

Flood control, channelization and bank stabilization efforts usually take one of several forms: diking, riprap, soil-cement, Kellner Jacks and/or gabions parallel to the channel; check dams across the channel; removal of woody debris from the channel and floodplain; and rerouting the channel. More rudimentary forms of bank stabilization can be found when old vehicles or other large objects are found stacked along a river bank. It is unknown how many efforts such as described above have occurred along the Verde River prior to the listing of threatened and endangered species and designation of critical habitat on the Verde River.

Removing trees, logs, and other woody debris from stream channels is a common form of flood control practiced by landowners and is seldom documented. Woody debris is very important in

stream function and fish habitat (Minckley and Rinne 1985, Debano et al. 1996). In the Verde Valley, removing riparian vegetation for this purpose continues (F. Toupal, NRCS, pers. com.).

Critical Habitat Considerations

The relative complexity of the Verde River watershed brings difficulty in assessing potential effects to listed species or critical habitat from various land uses. The presence of non-native fish adds considerable difficulty in distinguishing which elements are limiting recovery of these species. Approximately nine nonnative fish species occur within the Verde River system, within the action area (see tables below). Crayfish (*O. virilis*), another nonnative species present in the Verde River system, also pose a threat to native fish through direct predation.

Land uses, and their associated demands on water resources, water quality, stream function, and ecosystem health, should be considered when assessing or developing the baseline condition of the natural environment of a given area. In Arizona, hydrologic connectivity between shallow aquifers and perennial (or intermittent) streams is well documented. Groundwater pumping, in excess of natural aquifer recharge potential, will reduce surface flows resulting in changes in stream channel morphology and increasing a stream's vulnerability to the effects of erosion and subsequent sedimentation. These alterations can have significant, detrimental impacts to the associated riparian and aquatic habitat. In addition to water quality and abundance, parameters such as stream gradient (velocity) and substrate are important factors in spikedace and loach minnow habitat and are specific to the ontology of the fish species themselves.

Development, another resource use in the Verde watershed, has become a considerable threat to perennial streams and their tributaries and it is exacerbated by land exchanges between public and private entities. The Verde Valley has experienced an increase in population of 146% from 1980 through 2000 (USFS 2001b). Increasing populations require increasing water consumption, or increased pumping of regional aquifers for domestic use.

Mining for sand and gravel is an important industry in the Verde Valley from Tapco downstream to Camp Verde (Tellman *et al.* 1997). Demand for these materials has grown as the population and development increases. Growth in the Verde Valley and Flagstaff depend largely on Verde Valley sand and gravel. For every 1,000 new Arizonans, 7,000 additional tons of sand and gravel are required (Tellman *et al.* 1997). Gravel mining erodes the river channel and causes instability, migration of the stream channel, lowering of water tables, loss of sand and gravel to the river, increased siltation, and lowered water quality (Tellman *et al.* 1997).

While it appears that agriculture is decreasing in the upper portions of the Verde Valley, agricultural development has involved not only direct clearing of riparian vegetation, but also has resulted in the re-engineering of floodplains (e.g. draining, protecting with levees), diverting water for irrigation, groundwater pumping, and herbicide and pesticide application. These factors affect the maintenance and development of riparian habitat and can influence stream function and water quality (Finch and Stoleson 2000, USFWS 2001).

In the warm area of the Verde Valley, recreation is often concentrated in riparian areas of the Verde River because of the shade, water, aesthetic values, and the fishing, boating, swimming, and hiking opportunities it provides. These activities have reduced riparian vegetation due to trampling, clearing, wood cutting and soil compaction. Increased and concentrated recreation use also results in bank erosion; increased fire risk; and promotion of exotic aquatic and plant species (USFWS 2001).

Livestock grazing on private lands throughout the Verde Valley and U.S. Forest Service lands upstream and downstream of the Valley has regularly occurred since the 1880s, soon after settlers moved into the Valley (Tellman *et al.* 1997). By 1913, erosion, from damage to the watershed, had deepened the river channel. Beginning in the mid to late 1990s, the Prescott and Coconino National forests began to fence livestock grazing out of the floodplain of the Verde River on Forest Service lands. Concerns still persist on the effects of upland ranges on stream function.

Status of the species and critical habitat in the action area

The Verde River is vital to the survival and recovery of spikedace and loach minnow. It is one of the few rivers in the State that has retained much of the natural hydrograph for a large portion of its length. While spikedace has recently been recorded (AGFD 1999) on the upper Verde River, it has not been recorded in the action area through the Verde Valley. Conversely, loach minnow has not been found recently in the Verde River; yet surveys continue to try to find populations of this small fish (USFWS unpubl. data). Therefore, designated critical habitat for loach minnow is important to protect what habitat may exist for fish in the Verde River so that it can support future repatriation of loach minnow.

Spikedace

Spikedace have been recorded from the upper most reach of the Verde River (above Tapco and the Town of Clarkdale), although since 1996 they have been very rare, with none found in 1997 and 1998, and only one found in 1999 (AGFD 1999). This dramatic fluctuation is similar to earlier population fluctuations, but better documented (USFWS 2000). Spikedace numbers decrease substantially in the downstream direction, approaching Camp Verde, with historical sightings occurring in 1938 and 1950 (2001a). Comprehensive surveys for spikedace in the entire upper Verde River are lacking (R. Bettaso AGFD, pers. com.), but known population trends and historical records indicate that spikedace are either not present, or extremely rare throughout the action area and at the 260 Bridge site. Only a 1.3 mile stretch (separated into seven 980 foot sections) on the upper-most reach of the Verde River has been regularly and systematically targeted for the discovery of spikedace (USFS 2001a). Native fish biologists from both Arizona Game and Fish Department (R. Bettaso and P. Sponholtz) and the USFWS (S. Leon) believe that spikedace, while rare, persist in the upper-most reach of the Verde River.

Loach minnow

Loach minnows, alternatively, are considered extirpated from the entire Verde River system, with the last confirmed observations occurring in 1938 above Camp Verde (Minckley 1993, USFS

2001a, Girmendock and Young 1997). Surveys for loach minnow in tributaries of the Verde River are underway, but none have been detected (USFWS unpubl. data).

Habitat in the project area
Due to the amount of private land throughout the Verde Valley in the Town of Camp Verde, there are few places where the public can access to the river. Forest Service and private land land exist at the 260 Bridge and is one of the few locations in proximity to the Town where the public can recreate, however this is not a developed nor large recreation area. Roads enter the floodplain both upstream and downstream of the existing bridge. This is a relatively high use area with easy access.

EFFECTS OF THE ACTION

Direct and indirect effects to spikedace and loach minnow
There are no anticipated direct or indirect effects to living spikedace and loach minnow associated with the construction of the new Highway 260 Bridge over the Verde River. We are unable to reasonably conclude, based upon existing knowledge, that either species is present in the action area. However, an overwhelming portion of the upper Verde River has not been systematically searched for spikedace or loach minnow, including the action area and the 260 Bridge location.

Critical habitat
The proposed bridge construction is expected to have short-term, and possible long-term adverse effects to critical habitat for both fish species. These effects are expected to appear in the form of loss of fish living space, increased sedimentation, loss of riparian habitat, possible changes in channel geomorpholgy, and loss of habitat due to increased recreation. FHWA and ADOT have provided measures to reduce and minimize these effects as much as possible.

Installation of piers and the new bridge will effectively remove a small area of critical habitat for these fish. Approximately 369 cubic yards of concrete will be placed in waters of the U.S. to construct the pier footings. The permanent nature of the bridge and its piers will reduce and remove a small area of living space for fish and critical habitat during higher flows and if the river moves within the floodplain.

Road and bridge construction will lead to permanent removal of about an acre of riparian vegetation (USFWS 1999). Loss of riparian vegetation may destabilize streambanks, reduce cover and nutrient input, increase water temperatures, and remove or deplete the filtering capacity of the riparian zone for sediment and pollutants. Road construction and activity adjacent to the stream, even though vehicles are not entering the stream, may result in changes in riparian vegetation and stream channel morphology that reduces the quality and availability of spikedace and loach minnow critical habitat.

Drilling of the piers and future maintenance of the bridge will require vehicles to operate in the floodplain, but outside of the active channel. Critical habitat for both species is affected by

increased sediment deposition on the stream bottom. Adverse effects of stream sedimentation to fish habitat have been extensively documented (Murphy *et al.* 1981, Wood *et al.* 1990, Newcombe and MacDonald 1991, Barrett 1992, Waters 1995). Operation of vehicles in the dry channel can result in feeding loose sediment into the stream, and compaction of the floodplain. As a result, there may be short-term increase in sediment to the stream during construction of the piers.

Temporary pads will be created in order to provide the drilling platforms. This activity will require approximately 3,592 cubic yards of on-site soil that will be excavated from outside of waters of the U.S. While these materials will not be placed within the active channel, they will be added into the floodplain adjacent to the stream. No asphalt or construction waste materials of any kind will be included in the fill. The fill will be removed after drilling is complete and geotextile fabric will be placed between the pad and the floodplain to reduce sedimentation. It is expected that some of this loose material will enter into the active stream, and generate some increase in sedimentation. If flood pulses or stream flow increases during drilling, more of this fill is expected to enter into the live stream. The increase of fill into the stream would increase sediment into the stream and could result in a temporary or long-term change in flow patterns or possibly channel geomorphology.

While road access into the river at the 260 Bridge is not expected to change as a result of the project (because a bridge already exists), the overall goal of the additional bridge is to facilitate and accommodate expected urbanization and recreation of the Verde Valley and Verde River (Sverdrup 1998, USFWS 1999, HDR 2002). This indirect effect may degrade the land, water, and wildlife resources that support their activities by simplifying plant communities, increasing animal mortality, displacing and disturbing wildlife, and distributing refuse (Flather and Cordell 1995). Cole and Landres (1995) reported, based upon a compilation of research, the effects of recreation on soil. Most of these studies report the results of human trampling caused by hiking, camping, fishing, and nature study. These types of activities are expected to occur in the floodplain and flood-prone area associated with this project, as well as use by ATVs, bicycles, etc. Impacts to soils include the loss of surface organic horizons, compaction of mineral soil, reduction in macro and total porosity, reduction in infiltration rates, increases in soil erosion, and loss of vegetation. Other impacts include both reductions and increases in soil moisture and increases in diurnal and, perhaps, seasonal range of soil temperature. While urbanization and recreation of the Verde Valley does not rely on the existence of the additional bridge, the bridge is helping facilitate these actions based upon the expectation these activities will occur. As a result, the increased use of the Verde River in the action area due to urbanization and recreation, as a result of this bridge, is expected to adversely effect critical habitat.

Maintenance of the bridge will require periodic unspecified visits into the floodplain by vehicles to inspect the bridge, do maintenance work, and/or remove debris/sediment that may be trapped or built up at the bridge. While the piers will be outside of the active channel during construction due to low water conditions, all piers will exist within the 100-year floodplain. Therefore, the piers will be in the active channel in high flows, and possibly during low flows if the channel

shifts location. It is uncertain how the additional bridge and the additions of parallel piers and another set of abutments will affect sediment deposition and/or river channel geomorphology. The addition of each pier could lead to increased storage of sediment, debris, and/or vegetation. As a result, ADOT may need to regularly monitor and remove built up material, therefore increasing vehicle use in the floodplain. The developed road will be closed and gated, thus preventing other users from accessing the floodplain by ADOT's access road.

The addition of a parallel set of bridge piers and abutments could adversely affect channel geomorphology of the Verde River at the bridge, and upstream or downstream of the bridge. The current piers and abutments have not known to noticeably change flow pattern or channel geomorphology. The river in this area is characterized by predominately slow running water with some pooling at the edges of the main flow channel (HDR 2002). However, an additional set of piers and abutments could begin a chain reaction of events that could lead to a variety of changes. The piers could cause the river to pool, leading to a deepening of the river, and as result, improve conditions for exotic predatory fish. Or, the addition of the piers could lead to the destabilization of existing banks and an increase in the width to depth ratio of the river, leading to higher river temperatures and accumulation of fine sediment. The location of the river's channel may change in the future as other anthropogenic or natural stresses occur to the river. While these instances are not expected to occur (HDR 2002), there are uncertainties when permanent structures are added to a river ecosystem that is constantly trying to adjust itself to address its dynamic nature. Those changes may, in conjunction with the permanent bridge structure, alter the geomorphology of the channel in ways that adversely affect critical habitat for spikedace or loach minnow.

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.

Most of the land along the Verde River in the Verde Valley through the towns of Clarkdale, Cottonwood, and Camp Verde is privately owned. Ongoing activities occurring on these private lands that would be cumulative to the proposed action include residential use and development, commercial development, gravel mining, road development, surface water diversion, stocking of non-native aquatic species, groundwater extraction, livestock grazing, and irrigated cropping. These activities are largely the cause for these species to be listed and continue to contribute to the degraded condition of the stream channel and fish habitat in Verde River.

Future residential and commercial development in Yavapai County and the Verde Valley will occur. The Arizona Department of Economic Security predicted that the year round population in Yavapai County from 1997 to 2010 would increase about 37 percent or about 2.8 percent annually (SWCA 2001). The Camp Verde Chamber of Commerce predicts that the population of

their town will increase about 42 percent over the same time period (SWCA 2001). As a result, residential and commercial developments in the Verde Valley will escalate use of the Verde River's resources for water, recreation, agriculture, etc.

The future availability of surface water and groundwater to maintain river flow and other important river functions for listed species and critical habitat is threatened by groundwater pumping from the Big Chino aquifer at the headwaters of the Verde River. This aquifer provides 80 percent of the base flow of the upper Verde River (Wirt and Hjalmarsson 1999). The cities of Prescott, Prescott Valley, and Chino Valley have developed proposals to pump water from this aquifer and deliver water through a pipeline to these growing communities. Future projects such as the pumping of the Big Chino aquifer are anticipated to significantly alter the hydrology and groundwater of the Verde River, and subsequently the maintenance and recovery of habitat for listed species.

The cumulative effects of development on fish habitat in the Verde Valley are significant. The expected growth, development, recreation, and reliance on the resources of the Verde River will escalate. Cooperative ecosystem management plans seem less feasible as the number of home owners increases and parcel size decreases and where there is no historical or contractual basis for shared land stewardship (Knight *et al.* 1995).

Land use practices in the Verde River watershed, including those of the State, Tribal, private, and other lands are expected to continue to impact spikedace, loach minnow and designated critical habitat on the Verde River. Stream channelization, bank stabilization, or other instream management for water diversion are expected to impact fish and their habitat.

CONCLUSION

After reviewing the current status of the spikedace and loach minnow, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the 260 Bridge over the Verde River, as proposed, is not likely to jeopardize the continued existence of spikedace or loach minnow. It is also our biological opinion that the proposed action is not likely to destroy or adversely modify critical habitat of loach minnow or spikedace. These conclusions are based on: 1) our inability to reasonably conclude that spikedace or loach minnow occur in the action area; 2) the localized area of direct impact and; 3) FHWA and ADOT have implemented Conservation Measures to minimize adverse effects to critical habitat for spikedace and loach minnow. The Conservation Measures include avoiding entrance into the active water channel; implementing construction during times of low flow and when other listed species are not breeding; and implementation of best management practices to reduce and minimize increase in sedimentation or spilling of toxic materials. These conclusions 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 incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation 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 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 (50 CFR 17.3). "Harass is defined 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 (50 CFR 17.3). 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 do not anticipate the proposed action will incidentally take any spikedace or loach minnow. We are unable to conclude with reasonable certainty that either species is present in the project area.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the our Law Enforcement Office, Federal Building, Room 8, 26 North McDonald, Mesa, Arizona (telephone: 480/835-8289) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling 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.

1. We recommend that your agency work with Arizona Game and Fish Department and other land and wildlife management agencies to develop, fund, and implement a more thorough search for listed fish species, with an emphasis on spikedace and loach minnow on the Verde River and across their range in Arizona.

2. We recommend that your agency work with Arizona Game and Fish Department and other land management agencies to develop, fund, and implement actions to help spikedace and loach minnow recovery, including:

    a. renovation and repatriation efforts across the species' range;
    b. reduction in abundance and distribution of exotic fish species in key recovery areas;
    c. development of captive breeding facilities; and
    d. improvement in captive breeding techniques.

3. We recommend that your agency work with local communities to develop ordinances that would prevent future development from being at risk from natural river functions and thus the need to modify the river. Educate communities on issues such as maintaining dense riparian habitat and mesquite bosques along rivers to ensure control of erosion, slowing of flood forces, and filtering of pollutants. In conjunction, work to develop buffer zones between development and the 100-year floodplain that would protect and prevent damage to permanent structures, pavement, roads, agricultural fields, etc.

In order that we be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on reinitiation of the construction of the highway 260 Bridge over the Verde River on spikedace, loach minnow, and designated critical habitat for both of these species. 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 FHWA and ADOT's efforts to identify and minimize effects to listed species and designated critical habitat from this project. For further information please contact Greg Beatty

(x247) or Debra Bills (x239). Please refer to the consultation number, 2-21-98-F-403R1, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Acting Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Rick Duarte, Arizona Department of Transportation, Phoenix, AZ
John Kennedy, Arizona Game and Fish Department, Phoenix, AZ
Rob Bettaso, Arizona Game and Fish Department, Phoenix, AZ
Bob Posey, Arizona Game and Fish Department, Kingman, AZ
Tom Bonomo, Prescott National Forest, Camp Verde, AZ
Mike Leonard, Prescott National Forest, Prescott, AZ

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Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-83-F-013 reconsulted as 2-21-97-F-416	CR	Tonto National Forest Plan	planning	Salt Tonto Verde Gila	spikedace loach minnow Gila topminnow bald eagle peregrine falcon Yuma clapper rail AZ hedgehog cactus AZ agave	07-26-85 superceded by new consultation 12-19-97	ongoing	USFS	RO
2-21-83-F-020 reconsulted as 2-21-97-F-419	CR	Prescott National Forest Plan	planning	Verde Agua Fria	spikedace Gila trout bald eagle peregrine falcon	03-04-86 superceded by new consultation 12-19-97	ongoing	USFS	RO
2-21-83-F-14 reconsulted as 2-21-97-F-416	CR	Coconino National Forest Plan	planning	Verde	spikedace Little Colorado spinedace bald eagle peregrine falcon AZ cliffrose San Fran. peaks groundsel	04-01-86 superceded by new consultation 12-19-97	ongoing	USFS	RO
2-21-93-F-477	NJ	Emergency watershed protection, George Yard property	flooding	Verde	spikedace razorback sucker Colorado squawfish bald eagle	12-27-93	completed	SCS	State Office

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-92-F-550	J AM	Arizona water quality standards	pollution	Gila Salt Black White San Francisco Blue Eagle Bonita Tonto Verde Agua Fria San Pedro Aravaipa Santa Cruz Colorado Virgin Little Col. Bill Williams Yaqui	spikedace (J) loach minnow (J) Apache trout (J) beautiful shiner (NJ/AM) bonytail (J) desert pupfish (J/AM) Gila topminnow (J) Gila trout (J) humpback chub (J) Little Colorado spinedace (J/AM) razorback sucker (J) Sonora chub (J/AM) Virgin chub (J) woundfin (J) Yaqui catfish (NJ/AM) Yaqui chub (J/AM) Yaqui topminnow (J) brown pelican (NJ) bald eagle (J) Yuma clapper rail (J)	2-16-94	ongoing	EPA	San Francisco
2-21-96-F-187 this may have been reinitiated additonal times	NJ	1996 modifications			all those above plus whooping crane Canelo Hills ladies tresses Huachuca water umbel Sonora tiger salamander SW willow flycatcher	12-11-98			

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-90-F-119	J AM	Central Arizona Project potential to introduce and spread nonnative aquatic species	water development	Gila Salt Black White San Francisco Blue Eagle	spikedace (J/AM) loach minnow (J/AM) razorback sucker (J/AM) Gila topminnow (J) desert pupfish (NJ) Colorado squawfish (NJ) bald eagle (NJ)	04-20-94 amended 06-22-95 05-06-98 07-15-98 01-13-00 06-30-00	ongoing	BR	PAO
	NJ	Reinitiation		Bonita Tonto Verde Agua Fria San Pedro Aravaipa	Apache trout (NJ) Gila trout (NJ)	04-17-01			
2-21-93-F-395	NJ NAM	Verde Valley Ranch Dev	Housing	Verde	Razorback sucker (NJ/NAM)	11-09-94	completed	ACOE	DC
2-21-94-F-020	NJ NAM				Razorback sucker (NJ/NAM) SW willow flycatcher (J/AM)	02-23-96		ACOE	DC
2-21-94-F-309	NJ NAM				Razorback sucker, ch (NJ/NAM) SW willow flycatcher, ch (NJ/NAM)	10-07-97		EPA	DC
unnumbered	NE	Rainbow trout stocking in Verde River	stocking	Verde	spikedace razorback sucker Gila topminnow bald eagle	02-06-95	ongoing	FWS	Federal Aid
unnumbered	NJ NAM	Sycamore Canyon Road Stabilization	road	Verde	razorback sucker, ch	02-29-95	completed	FEMA	DC

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-95-F-291	NJ/NAM	Cedar Bench Allotment	grazing	Verde	razorback sucker, ch	09-08-95	ongoing	USFS	Tonto NF, Cave Creek RD
2-22-89-F-071	J/AM	West Bear/Del Rio livestock grazing management	grazing	Verde	spikedace (J/AM) razorback sucker (NJ)	draft 09-19-95 withdrawn 07-17-96	ongoing	USFS	Prescott NF Chino Valley RD
no number	INLAA	Ongoing grazing				unknown[2]			
part of 000089RO	INLAA	Ongoing grazing			spikedace (INLAA) razorbacksucker (NLAA) peregrine falcon(INLAA) Colorado squawfish(NLJ) MX spotted owl (INLAA)	04-30-98[2] 09-29-98[2]			
part of 2-22-99-F-016	INLAA	Term permit				verbal in 2000-grazing team			
In consultation	??	ongoing grazing and term permit			spikedace ch loach minnow ch	??-??-			
2-21-94-F-505	NJ/NAM	Tuzigoot bridge repair	construction	Verde	razorback sucker, ch (NJ/NAM) sw willow flycatcher, ch (NJ/NAM)	09-25-95	completed	NPS	State

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
unnumbered	NE	Stocking of sportfish into 90 locations in Arizona	stocking	Gila Salt Black San Francisco Eagle Tonto Verde Agua Fria San Pedro Santa Cruz Colorado Yaqui	spikedace loach minnow rrazorback sucker humpback chub bonytail chub desert pupfish Gila topminnow Little Colorado spinedace Apache trout beautiful shiner Yaqui chub Yaqui catfish Yaqui topminnow	10-31-95	ongoing	FWS	Federal Aid
2-21-95-F-413	NJ/NAM	Eureka Ditch	repair	Verde	razorback sucker & ch	12-04-95	completed	NRCS	State
2-21-95-I-440	INLAA	China Dam livestock grazing permit	grazing	Verde	spikedace razorback sucker bald eagle	12-??-95[2]	ongoing	USFS	Prescott NF Chino Valley RD
part of 000089RO	INLAA	ongoing grazing			spikedace loach minnow razorback sucker Colorado squawfish bald eagle peregrine falcon MX spotted owl	04-30-98[2]			
part of 2-22-99-F-016	INLAA	term permit			same as above plus Gila topminnow woundfin	04-20-00[2]			
In consultation	??	ongoing and permit			spikedace ch loach minnow ch	??			

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-91-I-075	INLAA	Fish stocking in Little Colorado, Agua Fria, Salt, and Verde River drainages	stocking	Agua Fria Salt Black Tonto Verde Little Col	spikedace loach minnow razorback sucker Gila topminnow Colorado squawfish bonytail chub Apache trout Little Colorado spinedace bald eagle	12-15-95	ongoing	FWS	AZFRO
2-21-94-I-386	INLAA	Baker's Pass Ecosystem Management Area (included Perkinsville, Horseshoe and Antelope Hills allotments)	grazing	Verde	spikedace razorback sucker bald eagle peregrine falcon	07-08-97[2] (date of FONSI)	ongoing	USFS	Prescott NF
part of 000089RO	INLAA	Antelope Hills and Perkinsville allotments - ongoing grazing			spikedace loach minnow razorback sucker Colorado squawfish bald eagle peregrine falcon MX spotted owl SW willow flycatcher	04-30-98[2]			
part of 2-22-99-F-016	INLAA	Antelope Hills and Perkinsville - term permit			as above plus Gila topminnow	04-20-00[2]			
2-21-01-I-011	??	Antelope Hills only			SW willow flycatcher ch	??			
In consultation	??	Antelope Hills, Perkinsville, and Horseshoe			spikedace ch loach minnow ch	??			

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-95-F-399 2-21-95-F-500 2-21-95-F-732	INLAA	Windmill grazing allotment	grazing	Verde	spikedace (INLAA) loach minnow (INLAA) razorback sucker (NJ) AZ cliffrose (NJ) Gila trout (INLAA) SW willow flycatcher (INLAA) MX spotted owl (INLAA)	10-28-97	ongoing	USFS	Coconino NF
2-000098RO 2-21-97-F-416	NJ	11 Forest Plans	planning	Gila Salt Black White San Francisco Blue Eagle Bonita Tonto Verde Agua Fria San Pedro Aravaipa Santa Cruz Little Col.	spikedace loach minnow razorback sucker desert pupfish Gila topminnow Little Colorado spinedace Apache trout Chihuahua chub Gila trout Sonora chub Yaqui catfish Yaqui chub 13 plants 2 herps 3 birds 3 mammals	12-19-97	ongoing	USFS	RO

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
no number	INLAA	Red Creek grazing allotment	grazing	Verde	Gila topminnow SW willow flycatcher	??-??-98[2]	ongoing	USFS	Tonto NF, Cave Creek RD
part of 000089RO	INLAA				lesser long-nosed bat bald eagle MS spotted owl SW willow flycatcher	04-30-98[2]			
part of 2-22-99-F-416	LAA				spikedace (INLAA) loach minnow Gila topminnow razorback sucker(NLAA) lesser long-nosed bat (INLAA) MX spotted owl (INLAA) SW willow flycatcher	04-20-00[2]			
2-21-99-F-022	NJ				loach minnow Gila topminnow SW willow flycatcher cactus ferr. pygmy owl	12-19-00			
2-21-98-F-403	INLAA	State Route 260 widening and bridge construction Cottonwood to Camp Verde	bridge	Verde	loach minnow razorback sucker (NJ) SW willow flycatcher(NJ)	10-01-98 3-5-99 (BO)	completed	FHWA	Phoenix
2-21-98-F-403R1	NJ	Reinitiation spikedace and loach minnow critical habitat			loach minnow & ch (LAA, NAM) spikedace & ch (LAA, NAM) pikeminnow (NJ)				

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
000089RO	NJ	Ongoing livestock grazing on 21 allotments Bear Valley Boneyard Buck Springs Bush Creek Chrysotile Colter Creek Cow Flat Dark Canyon Double Circles East Eagle Foote Creek Hickey Hicks/Pikes Peak Limestone Montana Mud Springs Nutrioso Pigeon Pleasant Valley Red Hill Sapillo Sardine Sears-Club/Chalk Mtn Sheep Spgs/Heber-Reno Sheep driveway South Escudilla Tule Wildbunch Williams Valley	grazing	Gila Eagle San Francisco Blue Black Salt Tonto Verde Little Col. Altar	spikedace loach minnow Gila topminnow Little Colorado spinedace Sonora chub razorback sucker peregrine falcon MX spotted owl lesser long-nosed bat AZ hedgehog cactus	02-02-99	ongoing	USFS	RO

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
000089RO continued	INLAA (for spikedace & loach minnow only)	13 Mile Rock Alexander Alma Alma waterlane Antelope Hills Apache Canyon Basin Beaver Creek Bee Springs Big Dry Black Bob Bobcat-Johnson Brown Springs Buckhorn Canyon Creek Cedar Breaks China Dam Chrysotile Citizen Colter Creek Copper Canyon Copper Creek Corduroy Corner Mountain Cow Creek Cow Flat Cross Bar Cross V Dark Canyon Deep Canyon Devil's Peak	grazing	Gila Eagle San Francisco Blue Black Salt Tonto Verde Little Col. Altar	spikedace loach minnow (many other species also were INLAA for these and other allotments)	04-30-98[2]	ongoing	USFS	RO

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
		Double Circles Dry Creek Eagle Peak East Eagle Fishhook Foote Creek Fossil Creek Frisco Plaza Gila River Govina Hackberry/Pivot Rock Harden Cienga Harve Gulch Haystack Butte Hickey Hicks-Pikes Peak Jerome Jordan Mesa Kelly Leggett Lightening Mesa Little Rough Luna Mangas Valley McCarty Mud Springs Negrito Perkinsville Pleasanton Pool Corral Red Creek							

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
		Red Hill Roberts Park Rudd Knoll Sardine Sedona Sedow Silverdale Squaw Peak Steeple-Mesa Stone Creek Strayhorse Taylor Tule Springs Upper Campbell Blue West Bear/Del Rio XSX Yeguas Young							
9-98-F-001	NJ	Army Corps of Engineers implementation of Nationwide permit 29 with the framework for development of Standard Local Operating Procedures - Endangered Species	many	all	all listed and proposed species	?? - ??-99	ongoing	COE	DC

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
2-21-00-I-099	INLAA	Rio Salado Town Lake stocking of rainbow trout and roundtail chub	stocking	Salt Gila Verde Agua Fria Tonto Black Blue White San Fran. upper Gila Eagle Bonita San Pedro Santa Cruz	spikedace loach minnow Gila topminnow desert pupfish razorback sucker Colorado squawfish Gila chub Chiricahua leopard frog brown pelican Yuma clapper rail SW willow flycatcher cactus ferr. pygmy owl bald eagle	01-10-01	completed	FWS	Federal Aid
In consultation see also 000089RO and 2-22-99-F-016	?	Livestock grazing, ongoing and term permits, on 15 allotments on Prescott NF Antelope Hills Brown Springs China Dam Copper Canyon Horseshoe Jerome Limestone Muldoon Perkinsville Sand Flat Squaw Peak Sycamore Verde West Bear/Del Rio Young	grazing	Verde	spikedace ch loach minnow ch	?	In consultation	USFS	Prescott NF Chino Valley and Verde RDs
2-21-01-F-124	??	13-mile Rock allotment management plan	grazing	Verde	spikedace ch loach minnow ch	??		USFS	Coconino NF

Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE
In consultation	?	grazing on Tonto NF	grazing	Salt Verde Tonto	spikedace ch loach minnow ch	?	In consultation	USFS	Tonto NF
2-21-01-F-272	NJ	Bayless watershed protection - Kellner jacks	flooding	Verde	spikedace & ch (LAA, NAM) loach minnow & ch (LAA, NAM) razorback sucker & ch (LAA, NAM) Colorado squawfish (NJ) SWwillow flycatcher &ch (NLAA, NAM)	8-15-01	completed	NRCS	Phoenix, AZ
2-21-01-F-148	NJ	The Homestead Housing Development	housing	Verde	spikedace & ch (NLAA, NAM) loach minnow & ch (NLAA, NAM) razorback sucker & ch (NLAA, NAM) Colorado squawfish (NJ) SWwillow flycatcher &ch (LAA, NAM)	12-26-01	completed	EPA	San Francisco, CA

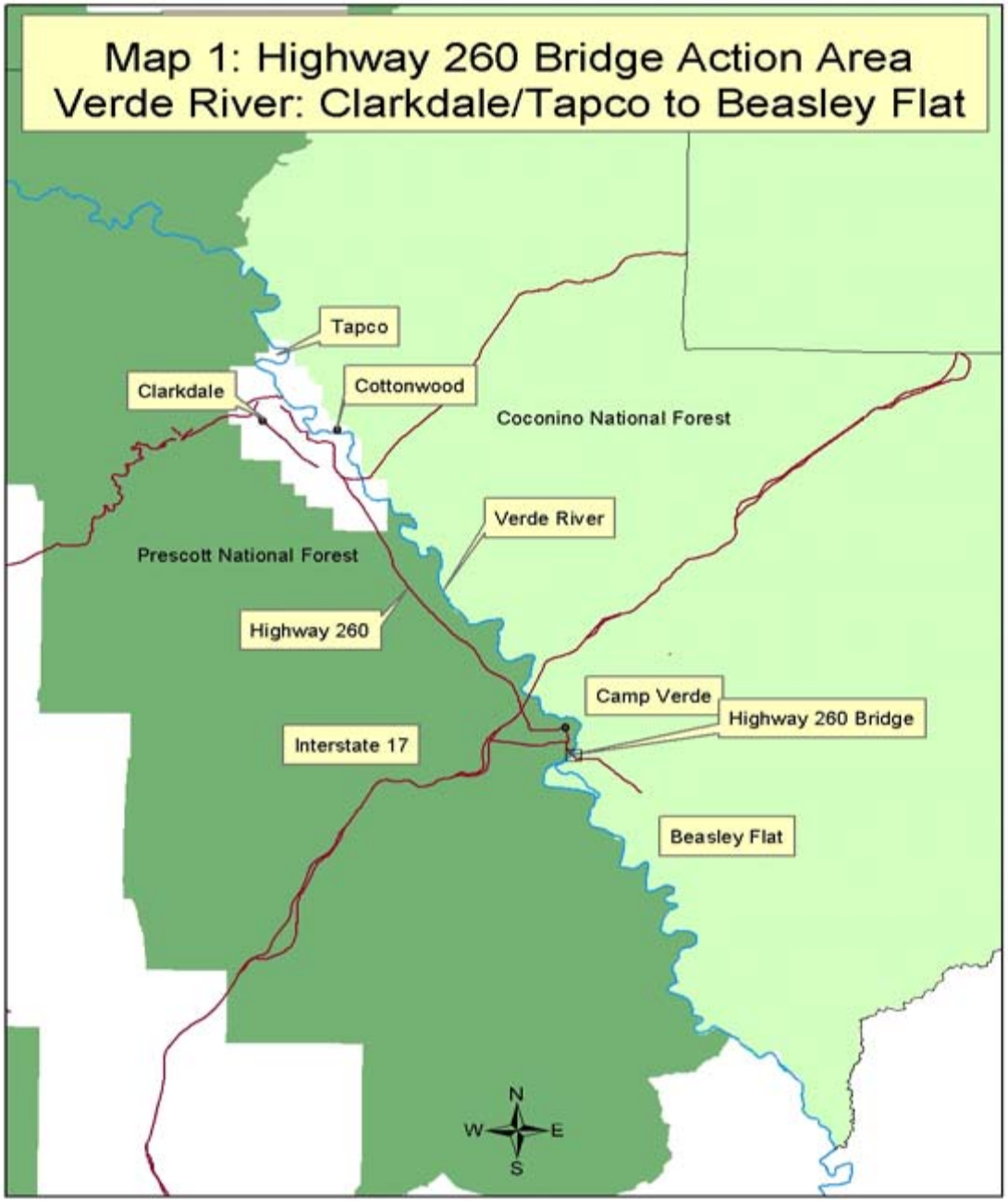
Appendix 1 - SECTION 7 CONSULTATION HISTORY - SPIKEDACE, LOACH MINNOW, RAZORBACK SUCKER on Verde River**

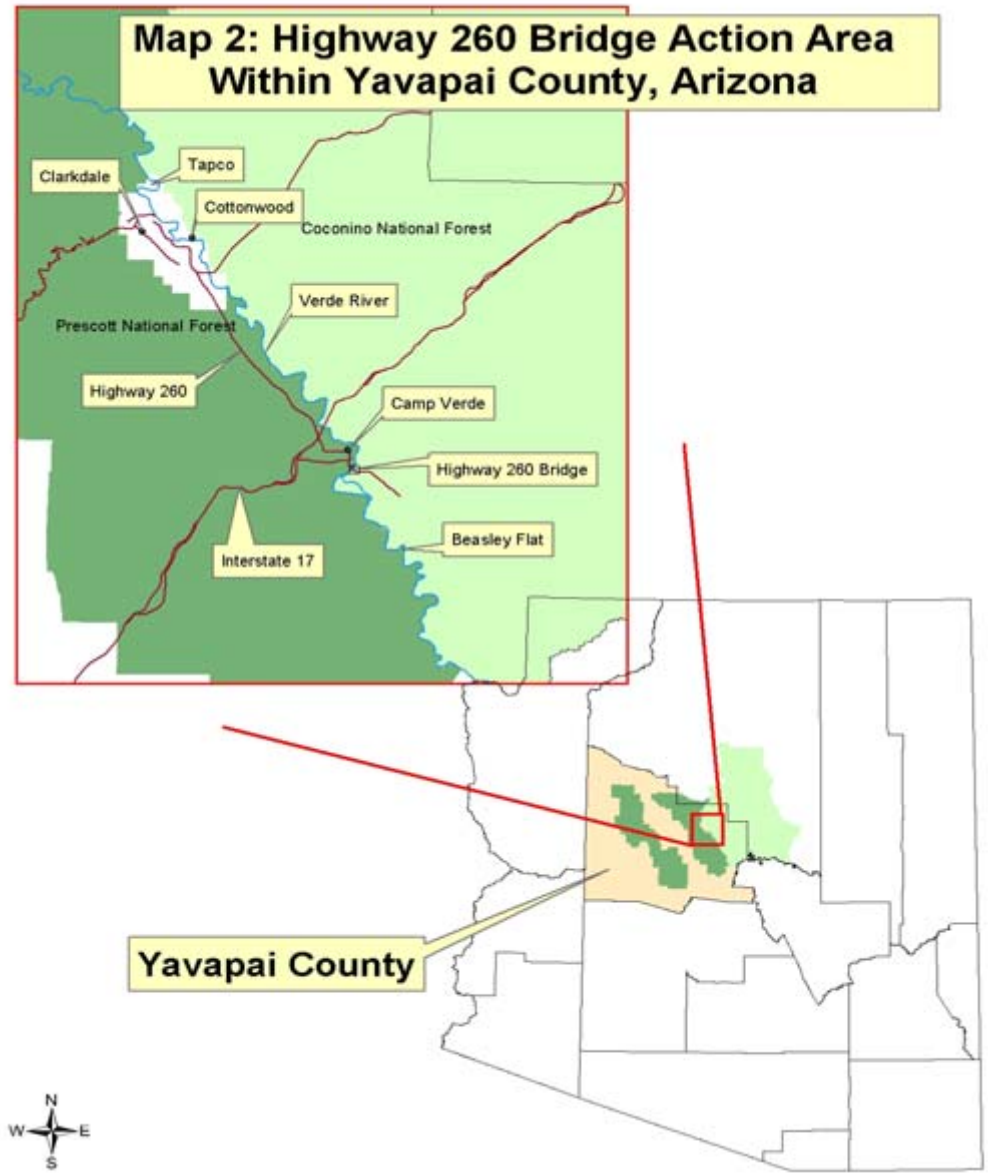
NUMBER	FINDING[1]	NAME	ACTION TYPE	SUB-BASIN	SPECIES	DATE OF FINDING	PROJECT STATUS	ACTION AGENCY	AGENCY SUBOFFICE

**Includes all biological opinions, known "is not likely to adversely affect findings, and known "no effect findings where significant effects to spikedace, loach minnow and razorback sucker may have occurred.

[1] (when multiple species are involved, this is the most restrictive finding for spikedace, loach minnow, or razorback sucker)
AM = adverse modification of critical habitat
BC = beneficial concurrence
CR = conference report
E = emergency
J = jeopardy
INLAA (or NLAA) = is not likely to adversely affect
LAA = likely to adversely affect
NAM = non-adverse modification of critical habitat
NC = nonconcurrence
NE = no effect
NJ = nonjeopardy

[2]This is the date of the biological assessment in which the USFS determined INLAA. These findings did not require concurrence from the FWS, but received a blanket concurrence or went through the grazing team, which did not document individual INLAA findings. The first blanket concurrence was on 05-05-95 and allotments for which this concurrence was used are generally not known. The second blanket concurrence was on 03-05-98 for ongoing grazing; the INLAA findings for this are documented in the USFS 04-30-98 and 09-29-98 biological assessments. The third blanket concurrence was on 09-10-98 and in a slightly different form on 09-18-98 for term grazing permits; the INLAA findings for this are documented in the USFS 04-20-00 biological assessment. In addition to the biological assessment INLAA findings, others were made verbally by the grazing team; no documentation is available for those.


Map 1: Highway 260 Bridge Action Area
Verde River: Clarkdale/Tapco to Beasley Flat
Tapco
Clarkdale
Cottonwood
Coconino National Forest
Verde River
Prescott National Forest
Highway 260
Camp Verde
Highway 260 Bridge
Interstate 17
Beasley Flat
N
W
E
S


Map 2: Highway 260 Bridge Action Area
Within Yavapai County, Arizona
Clarkdale
Tapco
Cottonwood
Coconino National Forest
Verde River
Prescott National Forest
Highway 260
Camp Verde
Highway 260 Bridge
Beasley Flat
Interstate 17
Yavapai County
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