Ms. Cindy Lester  
Chief, Arizona Section  
Los Angeles District, Corps of Engineers  
3636 North Central Avenue, Suite 760  
Phoenix, Arizona 85012-1936

Dear Ms. Lester:

Thank you for your memorandum requesting formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (Act) (16 U.S.C. 1531-1544), as amended. Your request for formal consultation was dated May 8, 2008, and received by us on May 14, 2008. Significant modifications to this project were made regarding the proposed fish habitat structures. The consultation concerns the adverse effects of your proposed Little Colorado River (LCR) and Nutrioso Creek Riparian Enhancement Project on the Little Colorado spinedace (*Lepidomeda vitatta*). You also requested our concurrence with your “may affect, is not likely to adversely affect” determination for the southwestern willow flycatcher (*Empidonax traillii extimus*), and Chiricahua leopard frog (*Lithobates chiricahuensis*).

We concur with your determinations and provide the basis for our concurrence in Appendix A.

This biological opinion (BO) is based on information provided in the April 2008 biological assessment (BA), numerous telephone conversations, field investigations, and other sources of information. References cited in this biological opinion are not a complete bibliography of all references available on the species of concern, the proposed activities and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.
CONSULTATION HISTORY

May 8, 2008  The Army Corps of Engineers (ACOE) sent a final biological assessment on the effects of the proposed action, and requested formal consultation.

September 9, 2008  We received a memo from Natural Channel Design (NCD) confirming the removal of aquatic habitat structures from the proposed action.

September 11, 2008  We received a phone call from NCD confirming the removal of backwater construction from the proposed action. The backwater construction may be addressed in a future consultation if surface water rights issues are finalized.

September 22, 2008  Project modification discussed with ACOE staff, Ron Fowler.

September 24, 2008  We sent a draft biological opinion to the ACOE. An extension of the consultation period was also requested.

October 2, 2008  The ACOE sent us a letter requesting the draft biological opinion be issued as the final biological opinion. There were no additional comments or concerns.

October 10, 2008  135-day consultation period ends.

BIOLOGICAL OPINION

DESCRIPTION OF THE ACTION AREA AND PROPOSED ACTION

The proposed action is issuance of a permit under 404 of the Clean Water Act for the LCR and Nutrioso Creek Riparian Enhancement Project (SPL-2008-396-RWF). The project is funded by an Arizona Department of Water Resources (ADWR) Water Protection Fund Grant (07-143 WPF). However, all fish habitat plans have been removed from the original proposal in order to protect the Little Colorado spinedace.

Description of the Action Area

The action area is defined as those areas influenced by direct and indirect effects of the proposed action (USFWS 1998a). The action area includes the LCR and its streambanks and Nutrioso Creek and its streambanks from the Highway 60 bridge downstream two miles to the Wenima Wildlife Area (WA) (Map 1). The project site, or construction footprint, involves 1,982 feet of river channel: 1832 feet on the LCR and 150 feet on Nutrioso Creek upstream of its confluence with the LCR. Specific treatment sites on the LCR are identified by station (STA) number, starting at STA 0.0 at the Highway 60, downstream to STA 1,832 feet. Nutrioso Creek treatment sites are located between STA 0.00 and 150 feet. The project site is approximately 4.5 acres on private property.
Proposed Action

The proposed project will repair and stabilize eroding streambanks and improve fish habitat in the LCR and Nutrioso Creek. LCR treatments will include streambank sloping, structural toe rock installation, and bioengineering practices (brush revetments, pole plantings, vertical bundles, and native plant seeding). All bioengineering work will use native riparian species. A water gap will be constructed to provide livestock access to water at STA 0.00 on one landowner’s property. Livestock are not present on the other private property. Willow plantings, to stabilize eroding streambanks, are the only proposed treatment on Nutrioso Creek.

Construction is planned for the fall 2008, and is anticipated to take no longer than three weeks to complete. Heavy equipment used during the construction phase includes an excavator to re-slope streambanks, a backhoe or track hoe to place rocks, a backhoe or front-end loader to move soil, and a dump truck to haul away excess soil and debris. All construction sites are easily accessible from either side of the LCR. Two river crossings may be necessary in order to construct the toe rock correctly, but their use will be limited.

A monitoring plan was developed for the structural components of this project and has been approved by the ADWR. If annual fall monitoring detects structural failure or erosion, design modification and implementation will take place during the five-year life of the grant.

The following treatments are part of the ADWR grant:

Structural Streambank Stabilization

Streambank Re-sloping
Streambanks with a slope steeper than 3:1 (slope extends horizontally three feet for every one foot in elevation) will be reshaped to provide a stable surface for riparian vegetation to establish and to reduce streambank erosion (Appendix B.1). A 3:1 slope is considered a stable streambank condition when protected with herbaceous and/or woody riparian vegetation (Allen and Leech 1997, Hoag and Fripp 2002). Re-sloped streambanks will be further stabilized with structural or bioengineering features. All disturbed areas will be reseeded, mulched, and protected with erosion fabric.

Toe Rocks
Toe rocks consists of angular rock placed along the base of eroding streambanks to protect the streambank toe (Appendix B.2). Rocks will range from six to 12 inches (in.) in diameter. Minimum thickness of the toe rock layer will be 18 inches placed on a maximum slope of 1.5:1. Rock will extend upward to the floodplain elevation to minimize the structural component and encourage vegetation growth. Bioengineering practices (see below) will be used with toe rocks to further enhance streambank stabilization.

Base Rock and Vegetated Geogrid
Vegetated geogrids will be installed to rebuild very steep eroded streambanks or to configure new streambanks with slopes too steep for other techniques (Appendix B.3). After willow cuttings become established, their root systems will penetrate the geogrids to form a cohesive
mass. The vegetated geogrid will be layered over angular base rock for footing and filled with gravel or soil about one foot thick. The geogrid will then be wrapped around the fill and another is started on top until the proper streambank height is reached.

**Coir Logs**

Coir logs, constructed of interwoven coconut fibers bound together with biodegradable netting, are used to protect the streambank toes (Appendix B.4). Logs will be installed to ensure contact with soil along the entire length. A shallow trench is excavated and two-thirds of the log is buried. Logs placed end-to-end are tied together and staked into place every four feet on both sides of log.

An excavator will slope the streambanks by working above the streambank. The streambank will be sloped from the bottom to the top. Spoil will be stockpiled above the ordinary high water mark (outside of the floodprone area) or hauled away. Well-established streambank toes will be left intact. The only anticipated sediment input will be the incidental fall back from the excavator bucket. All disturbed areas will be reseeded with native vegetation and covered with coconut/straw fabric to improve germination and reduce possible wind or water erosion while recovering. Additional sediment inputs will be minimal and temporary. The proposed action is designed to reduce the much larger, long-term sediment contributions from the existing eroding streambanks.

Heavy equipment use in the LCR will be kept to an absolute minimum. However, some in-stream work will be necessary to properly install toe rock and vegetated geogrids at STA 540 to STA 615 feet and at STA 1,425 to STA 1,555 feet. Active channel diversion would be the most effective means to reduce negative effects of heavy equipment working in the LCR channel. A water barrier system (plastic tubes filled with water) will be installed to temporarily divert flow away from work areas at STA 512 and STA 1,357 feet (Appendix B.6). Water barriers will be placed in the channel and on the floodplain to redirect flows across the floodplain. These water barriers will eliminate sediment discharge that would result if dirt berms were used to divert water. These water barriers will be removed and the area restored to its near original condition immediately upon completion of work. Excavated material from the toe rock trench will be placed on the meander streambank for removal from the area or used to fill the vegetated geogrids and to support the toe rock beginning at STA 1,425 feet.

**Bioengineering**

**Brush Revetment**

Brush revetment will use evergreen or other brushy trees tied end to end and placed along the streambank toe (Appendix B.5). Tree tops will face downstream and the tied trees are secured to T-posts or streambank anchors. The revetment will provide temporary structural protection to the streambank while riparian vegetation becomes established. Fine sediments will accumulate and eventually bury the revetment. Brush revetments will also provide shade and hiding places for fish and invertebrates. T-posts and anchors will be removed when streambank vegetation has become established.
Pole Planting
Native willow poles will be planted in the streambanks. Holes are drilled mechanically or hydraulically. Poles will be inserted into the drilled hole, watered, and backfilled with soil.

Containerized Plants and Post Plantings
Trees and shrubs will be planted in containers throughout the project site. Twenty-four cottonwood clusters (three posts per cluster) will be planted at 10 foot centers. Other tree and shrub species will also be planted. These clusters will be placed in holes excavated to the water table and backfilled with soil.

Vertical Bundles
Willow pole bundles will be planted along the entire extent of streambank. The bundles have their bases in the permanent groundwater and are expected to sprout, providing willow rootings well above the groundwater table and up the streambank slope.

Willow Trench
Willow poles will be buried perpendicular to the LCR channel, above the toe rocks, to provide short- and long-term protection to streambanks. Willow trenches will be used to redirect flows on terraces and slow flood velocities from overland flows.

Erosion Fabric over Reseeding
Erosion fabric constructed with straw, mulch, or other biodegradable material will be spread over seeded areas. The fabric will minimize seed and seedling loss from desiccation, blowing winds, high stream flows, and seed predation. Straw or other mulch will be protected with erosion fabric or other jute netting.

Conservation Measures

- Seine nets will be placed both up and downstream at specific work areas that involve structures being placed in the channel. Several seine passes would be made to temporarily relocate spinedace from the project site. NCD has the appropriate AGFD scientific collecting permit to allow this measure.

- All heavy equipment will be cleaned prior to use. Equipment will be checked daily for oil leaks and removed from service if repairs are needed.

- All activities will be completed prior to the spinedace spawning season, which begins in April.

- Designated vehicle routes to carry materials, personnel, and equipment in the project area shall be limited to access areas located on the design drawings (Natural Channel Design 2008) or determined in the field. Routes will be raked and re-seeded after construction is complete.

- Equipment will work from the streambank areas whenever possible.
Only two stream crossing will be used at STA 3+75 and STA 17+00. The two crossings will be restored to near their original condition when no longer needed. The crossings are in riffle sections where the river bottom is stable, the streambanks are low and intact, and erosion hazard is minimal.

Streambank materials excavated during streambank re-sloping or floodplain lowering will be removed from the bankfull channel and spread across the terrace areas.

All disturbed areas will be reseeded. Disturbed areas exposed to erosive stream flows will be reseeded and protected by erosion matting.

All channel and floodplain work will take place during the dormant vegetation growing season.

The project site will be immediately fenced for five years to protect vegetation and recovering streambanks from livestock grazing and recreational use.

STATUS OF LITTLE COLORADO SPINEDACE AND ITS CRITICAL HABITAT

Little Colorado spinedace

The spinedace was listed as threatened with critical habitat designated on October 16, 1987 (USFWS 1987). Threats were identified as habitat alteration and destruction, predation by and competition with non-native aquatic organisms, and recreational fishery management. Forty-four stream miles of critical habitat were designated: 18 miles of East Clear Creek immediately upstream and 13 miles downstream from C.C. Cragin Reservoir (formerly called Blue Ridge Reservoir) in Coconino County; eight miles of Chevelon Creek in Navajo County; and five miles of Nutrioso Creek in Apache County. Constituent elements of critical habitat consist of clean, permanent flowing water with pools and a fine gravel or silt-mud substrate.

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

Spinedace food habits include chironomid larvae, dipterans, filamentous green algae, and crustaceans (Runck and Blinn 1993, Blinn and Runck 1990). Spinedace are late-spring to early-summer spawners (Blinn 1993, Blinn and Runck 1990, Miller 1961, Minckley 1973, Minckley and Carufel 1967) although some females have been found to contain mature eggs as late as October (Minckley and Carufel 1967). A complete discussion of the taxonomic, distributional, and life history information of the spinedace has been compiled in the Little Colorado Spinedace Recovery Plan (USFWS 1998b).

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. 1994): the East Clear Creek
drainage, Chevelon Creek, and the upper Little Colorado River including Nutrioso and Rudd creeks. The study concluded that the observed genetic patterns were likely the result of populations isolated and differentiated by both natural and human-caused events. The East Clear Creek and Chevelon Creek sub-groups are more individually distinctive, likely the result of a higher degree of isolation, and possess unique haplotypes. Individuals from the upper Little Colorado sub-group are more similar to each other. Possibly, until recent time, there was one population with considerable gene flow until various dams and diversions increased local isolation. The cause and exact time of the isolation of the three sub-groups are not known, but Tibbets et al. (1994) recommend that all of these populations be maintained to conserve genetic variation in this species.

Native fishes associated with spinedace include speckled dace (*Rhinichthys osculus*), bluehead sucker (*Pantosteus discobolus*), Little Colorado sucker (*Catostomus* sp.), roundtail chub (*Gila robusta*), and Apache trout (*Oncorhynchus gilae apache*) (USFWS 1998b). The list of non-native fishes is much larger and includes species with varying degrees of incompatibility with the spinedace’s long-term survival. The presence of non-natives was one of the primary reasons the species was listed, and may contribute to the disjunctive distribution patterns observed and the spinedace’s retreat to what may be suboptimal habitats. Non-native fish may compete with, prey upon, harass, and alter habitat utilized by native fish. In the last 100 years, at least ten non-native fish species have been introduced into spinedace habitats. These include rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*), and golden shiner (*Notemigonus crysoleucas*). East Clear Creek surveys have documented the presence of these three non-native species and brown trout (*Salmo trutta*) in the watershed (Denova and Abarca 1992). Research experiments and field observations indicate rainbow trout is a predator and potential competitor with the spinedace (Blinn et al. 1993).

The spinedace is assumed to still occupy the streams it is known from historically (Chevelon, Silver, Nutrioso, East Clear creeks, and the LCR). Populations are generally small and the true population size for any occupied stream is unknown due to the yearly fluctuations and difficulty in locating fish. Spinedace have a tendency to disappear from sampling sites from one year to the next and may not be found for several years. This ephemeral nature makes spinedace management difficult because population responses to changes within the watershed cannot be measured with certainty. However, all of the known populations have decreased since 1993 and drought conditions continue to put additional strain on all spinedace populations.

The most recent spinedace survey and habitat data for each subgroup watershed are as follows:

**Chevelon Creek Watershed:** Currently, spinedace occupy a section of Chevelon Creek, on the privately owned Rock Art Ranch, several miles upstream of it confluence with the LCR. The Rock Art Ranch supports robust populations of spinedace. Large schools of fish (40-50 individuals) can be seen swimming in pools downstream of The Steps, something not seen in any other currently occupied area (Lopez et al. 1998).

On July 23, 2007, AGFD stocked 95 spinedace into five pools on West Chevelon Creek on the Apache-Sitgreaves National Forest. This tributary to middle Chevelon Creek contains only native fish at this time and is expected to provide spinedace habitat. In July 2008, spinedace
were located in the original five pools and downstream in ephemeral reaches. It is unclear how many fish are still present or if they spawned in 2008. Further surveys and stockings of this area are needed in order to ensure that spinedace persist in this Chevelon Creek tributary if it is to contribute to recovery.

Non-native species are present throughout Chevelon Creek, but green sunfish (*Lepomis cyanellus*) and crayfish (*Orconectes virilis*), both spinedace predators, were found to be uncommon in areas where spinedace numbers were highest (Lopez et al. 1998). Non-native fish presence may adversely impact the future abundance and persistence of spinedace in Chevelon Creek.

**East Clear Creek Watershed:** Spinedace currently occupy small, perennial pool habitats in West Leonard, Leonard, (including Dines Tank), Bear, Dane, and Yeager canyons. Spinedace populations and available habitat are all relatively small throughout the area. However West Leonard and Leonard canyons continue to be the most dependable locations to find spinedace in the entire watershed. The Bear, Dane, and Yeager canyon populations are sustained after moving spinedace from West Leonard Canyon and Dines Tank to these areas.

In October 2007, green sunfish (multiple size classes), largemouth bass, and yellow bullhead (*Ameiurus natalis*) were detected near the boat ramp and in the Bear Canyon arm of the C.C. Cragin (Blue Ridge) Reservoir. Surveys conducted to date in 2008 have not located these non-native fishes upstream of the reservoir. Currently Bear Canyon is the only spinedace-occupied habitat located upstream of C.C. Cragin Reservoir. However, efforts will be made to stock spinedace in Miller and Kehl canyons, which are also located upstream of the reservoir.

**Little Colorado River (including Nutrioso Creek and Rudd Creek):** Spinedace are documented in the LCR from Springerville downstream to St. Johns, Arizona (Dorum and Young 1995). Spinedace occur in small to moderate numbers on the LCR in the AGFD Wenima and Becker WAs. The most recent survey efforts in July 2005 found 39 spinedace at Wenima and 92 spinedace at Becker WA. Surveys conducted elsewhere in 2008 by the AGFD and BLM located spinedace above Lyman Lake in the LCR.

Spinedace have been located in middle Nutrioso Creek from the Apache-Sitgreaves National Forest boundary upstream to Nelson Reservoir and from Nelson Reservoir upstream to Nutrioso, Arizona (Lopez et al. 2001a). Spinedace were first located in Rudd Creek in 1994 (Lopez et al. 2001b).

AGFD personnel surveyed several 328-foot transects in Rudd and Nutrioso creeks in spring 2005. Only one spinedace was found in Rudd Creek. Seven spinedace were found upstream of Nelson Reservoir in Nutrioso Creek. No spinedace were found below the reservoir, but many fathead minnow and green sunfish were captured.

No spinedace were found in Rudd Creek in April 2006. However 76 spinedace were found in Rudd Creek in June 2006. The higher spinedace numbers in June surveys was attributed to seining rather than electro-shocking as done before in April.
One hundred-twenty eight spinedace were found in Nutrioso Creek upstream of Nelson Reservoir in 2006. The largest spinedace concentration was found in Nutrioso Creek on the EC Bar Ranch at Nutrioso, Arizona. No spinedace were located downstream of Nelson Reservoir (in Nutrioso Creek). However, in June 2006, AGFD located 415 spinedace in a drying pool in Nutrioso Creek that were moved into a more permanent pool on the EC Bar Ranch, and 74 spinedace in Rudd Creek. Surveys conducted in 2008 located spinedace above Nelson Reservoir, and above and below the gauging station on Nutrioso Creek. Spinedace were also located on lower Rudd Creek, below AGFD’s Sipes White Mountain WA.

**Silver Creek:** Spinedace were thought to be extirpated from Silver Creek until a small population was found in lower Silver Creek in July 1997 (Lopez et al. 1999). However, no spinedace have been found since, including after an extensive survey in 2004 (McKell and Lopez 2005). If spinedace are still present in Silver Creek, it may be that they exist at such low numbers that our current sampling techniques are insufficient to detect them in this altered pool habitat.

**Refugial Populations** There are currently two refugial populations: East Clear Creek spinedace located at the Flagstaff Arboretum and Little Colorado River spinedace at AGFD’s Grasslands Property. We currently do not have a refugial population for the Chevelon Creek genetic sub-group, although we expect to have a captive population established at Winslow High School in late 2008.

**Past Consultations** Twenty-seven formal consultations have been completed or are underway for actions affecting spinedace rangewide. Adverse effects to spinedace have occurred due to these projects and many of these consultations have required reasonable and prudent measures to minimize effects of incidental take on spinedace. However, as is the case with many aquatic species, it is difficult to quantify the actual incidental take of spinedace that has occurred. The continued invasion of non-native aquatic species into spinedace habitat and the on-going reductions in surface water (due to both drought and groundwater pumping) are two of the greatest threats to the species and are contributing factors to the spinedace’s overall decline.

**ENVIRONMENTAL BASELINE**

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

**A. Status of the Species and its Habitat in the Action Area:**

**Little Colorado Spinedace**
Spinedace presence is variable in the action area. AGFD surveyed the LCR at the Becker WA (upstream of the action area, north of Highway 60) and two miles downstream at the Wenima WA in 2005. Ninety-two spinedace were found at Becker WA; 39 spinedace were found at
Wenima WA (McKell 2005). No spinedace were found at Becker WA in 2007. Spinedace were not found in Nutrioso Creek in the action area. There is no Little Colorado spinedace critical habitat in the action area.

**Little Colorado River in the Action Area**

The LCR reach of the action area, was classified a “C5” stream type (Natural Channel Design 2008). “C5” type stream channels are sinuous, low gradient, with pointbars in the active channel, sand substrate, and with well-developed floodplains created and maintained by the river (Rosgen 1996). There is evidence of previous incision of the current floodplain located approximately 4 feet below the valley floor (Natural Channel Design 2008).

Seventy-five percent of the streambanks are actively eroding and unstable in the project site (Natural Channel Design 2008). The mean river channel width is 40.6 feet in the project site. Calculated channel dimensions are consistent with regional data and rivers with similar characteristics (Moody et al. 2003).

Past livestock grazing and recreational use has negatively impacted the vegetative community in the project site. The woody riparian plant community is dominated by shrubby species such as strapleaf willow (*Salix ligulifolia*), coyote willow (*S. exigua*), and Arizona rose (*Rosa woodsii*). Tree species: Siberian elm (*Ulmus pumila*), narrowleaf cottonwood (*Populus angustifolia*), and boxelder (*Acer negundo*) are also found in the project site. The wetland herbaceous community is comprised of numerous sedge (*Carex sp.*), rush (*Juncus sp.*), and grass species.

**Nutrioso Creek in the Action Area**

Nutrioso Creek, within the project site, is slightly upstream from its confluence with the LCR. Nutrioso Creek channel characteristics and dimensions were collected in the same manner as the LCR (Natural Channel Design 2008). Nutrioso Creek shows evidence of recent channel instability, recent incision, and subsequent channel widening. Because of the channel widening, small floodplains have formed and vegetation has become established. The streambanks are well vegetated with herbaceous wetland species, but lack woody riparian vegetation.

**B. Factors Affecting Spinedace in the Action Area**

The LCR is not a pristine river. LCR flow and physical attributes have been affected by watershed and floodplain land use changes, dam and diversion creation, instream gravel mining, and past and present cattle grazing practices.

Non-native fish are one of the most pervasive threats to native fish communities in the southwestern United States. Non-native fish may affect native fish and other aquatic fauna through predation (Meffe 1985, Marsh and Brooks 1989, Propst et al. 1992), competition (Lydeard and Belk 1993, Baltz and Moyle 1993), aggression (Meffe 1985), habitat disruption (Hurlbert et al. 1972, Ross 1991, Fernandez and Rosen 1996), introduction of diseases and parasites (Clarkson et al. 1997, Robinson et al. 1998, Choudhury et al. 2004), and hybridization (Dowling and Childs 1992, Echelle and Echelle 1997, Perry et al. 2002). Fathead minnows are found in the action area (McKell 2005). Green sunfish were found in Nutrioso Creek upstream of the action area (Carter et al. 2006). Spinedace are vulnerable from predation and competition from both of these species.
EFFECTS OF THE PROPOSED ACTION

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

Spinedace are not known to occur at the immediate project site, but they do occur in the action area. The project site will be seined prior to work in the channel to ensure no fish are present. The proposed action will adversely affect spinedace and its habitat by the presence and activity of heavy equipment working in the LCR. We believe that spinedace will not be adversely affected by actions in Nutrioso Creek because heavy equipment will not be used there.

Sedimentation caused by all construction activities will generally be limited to fine particles and gravels found in streambank sections. Sediments derived from bioengineering practices will be limited to soils displaced by hand tools as the banks are smoothed. Large flood events that occur immediately after construction could result in accelerated bank erosion. Sediment generated by this project may settle directly onto occupied spinedace areas downstream at Wenima WA. Adverse effects of stream sedimentation to fish and fish habitat have been extensively documented (Murphy et al. 1981, Newcombe and MacDonald 1991, Barrett 1992), and although spinedace can cope with some amount of sediment being carried in the water column, they prefer clear water which provides improved spawning sites. Sediment control measures are built into the project that will, if correctly implemented, prevent some of the fine sediment from entering the stream. Spinedace may be able to use more of the action area with improved water quality as a result of stabilized streambanks.

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 following section 7 of the Act.

The LCR flows through private lands in the action area. There are numerous diversions and irrigation outlets that reduce base flow in the LCR. One of the two private landowners will continue to graze cattle, but the numbers tend to be low and cattle will be restricted from the area for the first five years of the project.

In 1999, the Upper Little Colorado River Watershed Partnership developed a comprehensive plan for the upper Little Colorado River watershed. This project accomplishes a part of their goal of riparian enhancement along a section of the LCR. This partnership, in conjunction with past and future projects, will stabilize stream banks, enhance wildlife habitat, and maximize stream
function of the LCR. Given the small size of the action area, no other actions are likely to occur in these reaches of the LCR or Nutrioso Creek.

Any unforeseen effects of activities in the project area that do not have a Federal nexus could be addressed by a section 10(a)(1)(B) incidental take permit, if the action may result in take of spinedace.

CONCLUSION

After reviewing the current spinedace status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the threatened spinedace. We base this conclusion on the information below:

1. The Little Colorado spinedace is found in East Clear Creek and its tributaries (Coconino County); Chevelon and Silver creeks (Navajo County); and Nutrioso Creek, Rudd Creek, and the Little Colorado River (Apache County) in Arizona. The proposed action affects a small, but critical portion of the species’ range within the Little Colorado River drainage.

2. The project has been modified to be more protective of Little Colorado spinedace.

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 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 (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

Based upon the best available information concerning the spinedace and its habitat needs, and the project description, we do not believe that the short-term potential for increased sediment
into the LCR is reasonably certain to affect spinedace to the point where incidental take occurs. Currently, spinedace habitat quality is being reduced by ongoing inputs of sediment into occupied and suitable habitat. Though there is the potential for adverse effects to result from a short-term pulse of sediment, this will most likely be undetectable compared to the constant sediment input which will continue until the proposed action is completed. The implementation of the project will result in a reduction in the sediment inputs overall, not an increase.

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. Conduct stream surveys at the project site to determine if spinedace have moved into that LCR and Nutrioso Creek area.
2. Ensure that no fish structures are placed in the stream unless the structures will benefit Little Colorado spinedace.

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

Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made within three days to the FWS Law Enforcement Office, located at 2450 West Broadway Road #113, Mesa, Arizona 85202 (480) 967-7900. Written notification must be made within five calendar days and include the date, time, and location of the animal, and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to this office or the nearest AGFD office, educational, or research institutions (e.g., University of Arizona in Tucson) holding appropriate State and Federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, FWS should be contacted regarding the final disposition of the animal.
REINITIATION STATEMENT

This concludes the formal consultation on the Corps of Engineer’s proposal to permit construction of riparian and stream habitat improvements on private land along the LCR. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: 1) new information reveals effects of the agency action that may adversely affect listed species in a manner or to an extent not considered in this opinion; 2) the proposed action is subsequently modified in a way that causes an effect to a listed species that was not considered in this opinion; 3) a new species is listed or critical habitat designated that may be affected by this action; or 4) incidental take is exceeded.

We appreciate the Corps of Engineers efforts to identify and mitigate effects to spinedace from this project. We also encourage you to continue to coordinate this project with the AGFD. For further information please contact Dave Smith (928) 226-0614 (x109) or Debra Bills (602) 242-0210 (x239). Please refer to consultation number 22410-2008-F-0332 in future correspondence concerning this project.

Sincerely,

/s/ Debra Bills for Steven L. Spangle
Field Supervisor

cc: Regional Supervisor, Arizona Game and Fish Department, Pinetop, AZ
Natural Channel Design, Inc., Flagstaff, AZ
Arizona Department of Water Resources, Phoenix, AZ
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
REFERENCES CITED


Natural Channel Design, Inc. 2008. Biological evaluation for the Little Colorado River and Nutrioso Creek riparian enhancement project Springerville, Arizona Water Protection Fund Grant No. 07-143WPF. Flagstaff, Arizona.


Appendix A: Concurrences

**Southwestern Willow Flycatcher**

We concur with the finding of “may affect, not likely to adversely affect,” for the willow flycatcher from the proposed action for the following reasons:

- There are no known breeding southwestern willow flycatchers in the action area.
- Recent surveys report the nearest known willow flycatcher occurrence is approximately 12 miles south of the project site and at a higher elevation.
- Currently, there is no suitable habitat at the project site. The project site has coyote and strapleaf willows, but these are less than 10 feet high and occur in smaller clumps and patches along the LCR.

The proposed bioengineering treatments will increase woody riparian vegetation along this portion of the LCR and benefit willow flycatchers by providing breeding and migratory habitat.

**Chiricahua Leopard Frog**

We concur with the finding of “may affect, not likely to adversely affect,” for the Chiricahua leopard frog from the proposed action for the following reasons:

- Chiricahua leopard frogs are considered to be extirpated from the LCR watersheds found in the action area (USFWS 2002).
- Although LCR watersheds are known to contain historical leopard frog sites, none of these sites occur within the action area. No individuals have been located in or near the project site though suitable habitat exists. No surveys have been conducted for this project.
- A review of the AGFD Heritage Database has no records of this species being located within a 3-mile radius of the project (Natural Channel Design 2008).
Appendix B. Structural Feature Figures.

B.1 Streambank sloping diagram from project blueprints.

B.2 Toe rock diagram from project blueprints
B.3 Vegetated geogrid diagram from project blueprints.

B.4 Coir log installation diagram from project blueprints.
B.5 Brush revetment diagram from project blueprints.

- Place top of last tree behind existing vegetation and/or into bank to ensure a smooth and secure transition.
- Overlap end of upstream tree water side to butt end of downstream tree bank side and secure.
- Place trunk of first tree behind existing vegetation and/or into bank to ensure a smooth and secure transition with no gaps.

PLAN VIEW
(Not to Scale)
B.6 Water diversion structure diagram from project blueprints.
Map 1. Project site for the Little Colorado River and Nutrioso Creek riparian enhancement project, Springerville, Arizona.