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In Reply Refer To:
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22410-2007-F-0224
02-21-05-F-0086
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August 6, 2007

Memorandum

To: Field Manager, Safford Field Office, Bureau of Land Management, Safford, Arizona

From: Field Supervisor

Subject: Biological Opinion on the Effects of the Proposed Restoration and Maintenance of Existing Roads Damaged by Severe Flooding in Aravaipa Canyon and Turkey Creek, Graham County, Arizona

Thank you for your request for formal consultation pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated February 26, 2007, and received by us on February 28, 2007. At issue are impacts that may result from the Proposed Restoration and Maintenance of Existing Roads Damaged by Severe Flooding in Aravaipa Canyon and Turkey Creek, Graham County, Arizona. The proposed action is likely to adversely affect the threatened spinedace (*Meda fulgida*) and its critical habitat, and the threatened loach minnow (*Tiaroga cobitis*) and its critical habitat.

This biological opinion is based on information provided in the February 2007, biological evaluation, our files, other sources of information as detailed in the consultation history, and literature cited. 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

- February 28, 2007 - Received request to initiate formal consultation and the Biological Evaluation.
- March 26, 2007 – Memorandum to Bureau of Land Management (BLM) stating that we received sufficient information to begin formal consultation.
- July 6, 2007 – E-mail from your office requesting (1) to change your request from concurrence that the proposed action was not likely to adversely affect loach minnow and spinedace proposed critical habitat to a request for formal consultation, (2) that no draft biological opinion be sent to you for review, and (3) that we issue a final biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Several large monsoon storms resulted in significant rainfall in the watershed of Aravaipa Creek during July and August 2006, causing extensive flooding and erosion (see Appendix). Access roads on both entrances (east and west) of Aravaipa Canyon Wilderness were severely damaged and impassable. While flooding is an important part of this ecosystem, the impacts to existing roads and recreation sites have negative effects on the natural environment. Specifically, loss of designated travel routes has resulted in motorized travel off-road through fish and wildlife habitat. Damage to the east end included severe erosion along Turkey Creek, a tributary to Aravaipa Creek. At present, access to Turkey Creek is limited to all-terrain vehicles due to fallen trees and extensive gullies. The current routes used by the public are, in some cases, directly in the active channel of Aravaipa Creek (Appendix, Photo 1) and Turkey Creek. Some members of the public have also inadvertently operated their vehicles in the Aravaipa Wilderness. The purpose of the proposed action is to reduce these adverse effects to natural resource values in the area, including fish and wildlife habitat, by redefining and improving the road network that existed prior to the 2006 floods.

You propose to take the necessary actions in both Aravaipa Canyon and the side canyon of Turkey Creek to reopen and redefine the existing roads. Along Aravaipa Canyon, virtually all of the proposed action will take place on private lands owned by The Nature Conservancy (TNC). A small portion along Aravaipa Canyon and the entire work area in Turkey Creek are on BLM lands. The project will be accessed via the Aravaipa Canyon Road coming from Klondyke, AZ. This action will be implemented some time in calendar year 2007. The project will be completed in the minimum number of days necessary.

The project will start at Aravaipa Creek's confluence with Bear Canyon. In Aravaipa Canyon, between Bear Canyon and the Turkey Creek confluence, a D-4 dozer will be used to define and smooth the ingress and egress on three active channel crossings of Aravaipa Creek (Map 1). The ingress and egress will be smoothed in up to five dry side channels that have cut across the preexisting road. Just upstream of the Turkey Creek confluence, a large debris pile will be all or partially removed (Appendix, Photo 2); some of the debris will be cut and moved just off the road by hand and chainsaw; other pieces may be moved intact to block other vehicle routes. The dozer will be used to the minimum extent possible to redefine the road to the confluence of Turkey Creek (Appendix, Photos 2 and 3). The dozer work along Aravaipa Creek is expected to be 500 feet or less.

The project will continue from the Aravaipa confluence with Turkey Creek south along the Turkey Creek road for approximately 1.5 miles. Downed trees and limbs will be cut and moved off the road or moved intact to block other routes (Appendix, Photos 4 and 5). Ingress and egress on several crossings will have to be smoothed (Appendix, Photo 6). In addition, some segments of the road will be minimally bladed with the dozer (Appendix, Photo 7). Total blade work in Turkey Creek is not expected to exceed 1,500 feet (Map 1). Cutting and removal of the smaller-sized debris will be by hand, handtools, and small mechanized tools (e.g., chainsaws).

BLM personnel familiar with this proposed action will monitor the implementation on site as it is occurring. Monitoring will also be documented with before-and-after photos.

In the future, to provide for long-term use and reduce the need for routine road maintenance along Aravaipa and Turkey creeks, this proposed action will be followed by other proposed actions with more extensive work. A separate Biological Evaluation will be prepared, and consultation requested, if necessary. Use of the roads addressed in this proposed action will be addressed in the Aravaipa Ecosystem Management Plan. We are currently in informal consultation with the BLM on that plan.

Conservation Measures

As part of the proposed action, your office has committed to implementing certain conservation measures that will reduce negative effects of the proposed action on loach minnow and spikedace:

1. BLM personnel knowledgeable with the proposed action and resources in the area will be on-site to monitor implementation to ensure that the proposed action is being implemented as detailed in this BO.
2. Blade work will be minimized to include only that necessary to reopen, redefine, and stabilize the roads.
3. A specialist knowledgeable in the hydrology and soils of the area will assess the effects of fine soil movement from the proposed action. Appropriate actions will be taken if it is determined that measurable deposition of fine substrates will occur in loach minnow and spikedace habitat.
4. Only equipment free of oil and fluid leaks will be allowed to work in the area. Equipment maintenance, fueling, and parking will take place as far from the active channel as is practicable to minimize the potential for contamination of the stream.

STATUS OF THE SPECIES

Loach Minnow and Spikedace

Loach minnow and spikedace were listed as threatened species in 1986 (51 FR 23769; 51 FR 39486). The loach minnow and spikedace recovery plans were completed in 1991 (U.S. Fish and Wildlife Service 1991a, b). Critical habitat was designated on March 21, 2007 (FR 72 FR 13356). Approximately 522.2 river miles of critical habitat were designated in New Mexico and Arizona.

Our information indicates that, rangewide, more than 250 consultations have been completed or are underway for actions affecting loach minnow and spikedace. One-third of these opinions concerned the effects of grazing. One-third focused on roads, bridges, or agency planning. The remaining third dealt with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery, and water-quality issues.

Although loach minnow and spikedace are 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 (U.S. Fish and Wildlife Service 1994).

Loach minnow is a small, slender, elongate fish with markedly upwardly-directed eyes (Minckley 1973). Historical 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 non-native 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, Propst *et al.* 1986, Propst *et al.* 1988, Marsh *et al.* 1990, Bagley *et al.* 1995). 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 feed exclusively on aquatic insects (Schrieber 1978, Abarca 1987). Loach minnow live between two and three years with reproduction occurring primarily in the second summer of life (Minckley 1973, Sublette *et al.* 1990). 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).

Spikedace is a small silvery fish whose common name refers 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 middle and upper Gila River, 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). The species also may occur in the upper Verde River. It has not been documented in the Verde River since 1999 despite annual surveys; additional survey work is needed to determine its current status there. Habitat destruction along with competition and predation from introduced non-native 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 geographical variation (Barber *et al.* 1970, Anderson 1978, Propst *et al.* 1986). Actual spawning has not been observed in the wild, but captive studies indicate eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace lives 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).

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

The status of loach minnow and spikedace is declining rangewide. They are currently restricted to 419 miles of streams. Loach minnow current range represents only 15 to 20 percent of its historical range and spikedace current range represents only 10 to 15 percent of its historical range. In occupied areas, loach minnow and spikedace may be common to very rare. Loach minnow and spikedace are common only in Aravaipa Creek, the Blue River, and limited portions of the San Francisco, upper Gila, and Tularosa rivers in New Mexico.

Critical Habitat

Critical habitat for both loach minnow and spikedace includes approximately 522.2 river miles in Arizona and New Mexico, organized into three complexes for spikedace and four complexes for loach minnow. The stream segments within each of the complexes are defined using legal descriptions to identify the upstream and downstream limits (72 FR 13356) and by the area of bankfull width of the particular stream, plus 300 feet on either side of the stream's edge at bankfull. The four complexes for loach minnow are: the Black River complex in Apache and Greenlee counties, Arizona; the Middle Gila/Lower San Pedro/Aravaipa Creek River complex in Pinal and Graham counties, Arizona; the San Francisco and Blue Rivers complex in Pinal and Graham counties, Arizona, and Catron County, New Mexico; and the Upper Gila River Complex in Catron, Grant, and Hidalgo counties, New Mexico. The three complexes for spikedace are: the Verde River complex in Yavapai County, Arizona; the Middle Gila/Lower San Pedro/Aravaipa Creek River complex in Pinal and Graham counties, Arizona; and the Upper Gila River Complex in Catron, Grant, and Hidalgo counties, New Mexico.

Primary constituent elements of critical habitat for loach minnow and spikedace were identified in the final rule as necessary for the survival and recovery of this species. Each stream segment contains at least one of the primary constituent elements and requires special management consideration. There are five primary constituent elements for each species, which are: 1) permanent and flowing water with low levels of pollutants; 2) sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness; 3) streams that have low gradients appropriate for each species; appropriate water temperatures for each species; pool, riffle, run, and backwater components; and abundant aquatic insect food; 4) habitat with no or low levels of detrimental, non-native fish species that allow persistence of loach minnow and spikedace and their habitat; and 5) areas within perennial, interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

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

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. The action area for this project includes the project area and 1/8 mile downstream in Aravaipa Creek. This is the expected extent of possible direct or indirect effects of implementing the proposed action.

A. ENVIRONMENTAL DESCRIPTIONS AND CONDITIONS IN THE ACTION AREA

Aravaipa Canyon and Turkey Creek are significant riparian areas located in southeastern Arizona. With headwaters in the Galiuro, Santa Teresa, and Pinaleño mountains, Aravaipa Creek is joined by Turkey Creek, its major tributary, west of Klondyke in Graham County. The watershed includes the 19,410-acre Aravaipa Canyon Wilderness managed by the BLM; Aravaipa Canyon Preserve, managed by TNC; and several Areas of Critical Environmental Concern (ACECs) designated by the BLM. Aravaipa Creek is a perennial stream with cottonwood and sycamore riparian overstory while Turkey Creek is predominantly sycamore and oak woodlands. Soil substrate in the project area is mainly sand, gravel, and cobble. Very little fine substrates are in the project area. Both canyons are surrounded by uplands of Sonoran Desert habitat. The project would take place within the riparian area following existing roadways.

B. STATUS OF THE SPECIES WITHIN THE ACTION AREA

Loach Minnow and Spikedace

TNC, the University of Arizona, and the BLM census native fish within Aravaipa Creek twice a year. The results of these surveys show that occupied loach minnow and spikedace habitat occurs throughout the wetted portions of Aravaipa Creek in the action area. Loach minnow occupied habitat also occurs in Turkey Creek. Aravaipa Creek supports one of the most protected loach minnow and spikedace populations due to special use designations on BLM land, substantial ownership and protective management by TNC, and fish barriers located downstream to prevent invasion of non-native fish species. Loach minnow are found from the downstream non-native fish barriers upstream to above Turkey Creek (Peter Rienthal, University of Arizona, pers. comm., November 21, 2006), in Deer Creek upstream from its confluence with Aravaipa Creek to the Aravaipa Canyon Wilderness boundary, and in Turkey Creek. Spikedace are found from the mid-point of the canyon at Horse Camp Wash upstream to above Turkey Creek (Peter Rienthal, University of Arizona, pers. comm., November 21, 2006). It is believed that spikedace occurred throughout the canyon at one time, but has been virtually absent from the lower reaches of Aravaipa Canyon since the 1970s.

Specific numbers and trend information are difficult to describe because it was necessary to use different fish survey methods due to the varied conditions in the different reaches. These conditions can change from one year to the next. It is difficult to extrapolate population data when different survey methods are used from year to year, but intensive monitoring has demonstrated that loach minnow and spikedace persist in the Aravaipa Creek area, that the populations are likely stable throughout the system, and that populations are robust under current management.

Loach minnow critical habitat has been designated in Complex 3 (including Aravaipa Creek and Turkey Creek) within the action area, which is mostly occupied. Spikedace critical habitat has

been designated in Complex 3 (including Aravaipa Creek) within the action area, which is mostly occupied. All of the project area is within designated critical habitat for loach minnow and/or spikedace.

C. FACTORS AFFECTING THE SPECIES' ENVIRONMENT WITHIN THE ACTION AREA

In this section we summarize the most important factors that have affected the listed species and their habitats in the action area. We also refer the reader to the Environmental Baseline in the Reinitiated Biological and Conference Opinion on the effects of the Safford Resource Management Plan (December 12, 2006) (BO) for other information relevant to the ways in which past and current activities affect species.

Loach Minnow and Spikedace

Currently, the primary management action affecting loach minnow and spikedace in Aravaipa Canyon may be permitted hiking that occurs in Aravaipa Creek. Refer to the Reinitiated Biological and Conference Opinion on the effects of the Safford Resource Management Plan (#02-21-05-F-0086) for information regarding this activity.

Due to the beauty of the area and abundance of wildlife, the area is well known and very popular for recreational activities. Hiking, camping, hunting, birding, and wildlife viewing are the major pursuits. Driving on backcountry roads is also a popular pastime, and the Aravaipa and Turkey creek roads are used by two- and four-wheel drive vehicles, ATVs, and motorcycles, and provide access to the challenging Rug Road that traverses Table Mountain and connects to Mammoth.

Despite riparian and aquatic habitat improvement, the presence of non-native fish that compete or prey upon loach minnow and spikedace may be the most significant and difficult factor to correct within the action area. Two fish barriers were constructed by the Bureau of Reclamation in 2001 in the lower reaches of Aravaipa Creek to prevent non-native fishes in the San Pedro River from entering this area.

Recently, concerns regarding lead from mine tailings in the area have been discussed. Lead from two mine tailings have been deposited in the general area, either wind driven or through precipitation runoff. This has been occurring for many decades, but the flooding in summer 2006 raised concerns about direct movement of lead from a mine tailing along Aravaipa Creek. Current levels of lead in the system have not seemed to limit population persistence or levels, but sampling of the aquatic system is occurring to monitor the effects of lead levels. The Arizona Department of Environmental Quality is currently considering some actions to limit flooding of the mine tailing next to Aravaipa Creek.

EFFECTS OF THE ACTION

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

Specific locations and extent of effects to fish, eggs, and habitat are difficult to determine due to the dynamic nature of the stream habitat and because we are currently in the summer rainy season during which habitat quality at specific sites is likely to change with floods, scouring, and sedimentation. However, effects to the species may occur along Aravaipa Creek and Turkey Creek in the project area during access to the work areas and as roads and creek crossings are redefined. Fishes and eggs may be directly harmed or killed during heavy equipment and vehicle operations within the creeks. We anticipate relatively few adult or juvenile individuals of these species are likely to be harmed or killed because the proposed action within the creek would be implemented in less than 2000 feet of the creeks and in less than 30 days. Adult fish, in particular, will often be able to avoid harm by moving away from project sites. The number of eggs expected to be lost is difficult to quantify, depending on whether eggs are present (work will occur outside of the main breeding season of March to May), and the concentration of eggs if present, in the treated area at the time of implementation.

Temporary, indirect impacts to species could occur from fine sediment movement caused by disturbances in the aquatic area but, because the substrates are mainly sand, gravel, and cobble, the effects would be very small (possibly not measurable), and would only temporarily affect adults, juveniles, and eggs. These effects would occur within the context of a dynamic aquatic system that likely will experience sediment movement as a result of storms and flooding.

Although there will be short-term adverse impacts, in the longer-term the proposed action will result in reduced vehicle impacts to the creeks, and to the species, from what is currently occurring because the number of crossings will be returned to previous locations and travel outside the roads will be much reduced. While there is a chance of increased vehicle use in the area once the roads have been reconstructed, this increased use will be limited to the existing roads, and the decreased incentive to drive vehicles off of those roads will result in greatly reduced off-road use. Recreationists on foot in the creeks may increase above what the area currently receives, but this increase will result in substantially less impact to loach minnow and spikedeace individuals and habitat than what is currently occurring from vehicle use.

Temporary, adverse effects to primary constituent elements of critical habitat may result in the form of some fine sediment moving from one site to another. Some deposition may occur in the sand, gravel, and cobble substrates in the creeks, but these levels are anticipated to be low enough that the low or moderate level of embeddedness of these areas will not change. Other primary constituent elements are unlikely to be affected.

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.

Human development, recreational site encroachment, and changes in land-use patterns on non-Federal lands around occupied and potentially-occupied reaches of Aravaipa Creek that further fragment, modify, or destroy upland or riparian vegetation negatively affect water quality and quantity. Increased development and continuation of agricultural and livestock grazing practices may result in the drainage, development, or diversions of wetland and aquatic habitats that reduce water quantity and quality, and destroy spawning and other important habitats. If additional bait-bucket or other introductions of non-native fishes occur in occupied reaches of Aravaipa or Turkey creeks, increased resource competition and direct mortality from predation would likely result.

CONCLUSION

After reviewing the current status of the loach minnow and spikedace, and their critical habitat, 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 neither likely to jeopardize the continued existence of the loach minnow or spikedace, nor likely to result in destruction or adverse modification of critical habitat. We note that this BO does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

We base our conclusions on the following:

1. Although short-term adverse effects are expected, the proposed action will direct vehicle use to specific wet crossings and decrease the incentive to drive off of roads which will result in greatly reduced off-road use. As a result, in the longer term, vehicle use in and adjacent to Aravaipa and Turkey creeks will have less direct and indirect effects to individual fishes, fish eggs, and critical habitat. This action is therefore a long-term benefit to the spikedace, loach minnow, and their critical habitat.
2. Actions that may have adverse negative effects to loach minnow and spikedace habitat generally will include conservation measures to eliminate or minimize those effects.
3. Loach minnow and spikedace continuously occupy the Aravaipa Canyon area, including BLM-administered lands in the action area. This area is actively managed to maintain and improve riparian and aquatic resources, therefore any short-term adverse effects and population reductions should be overcome rapidly.
4. TNC, the University of Arizona, and the BLM census native fish within Aravaipa Creek twice a year; thus, loach minnow and spikedace populations are well-monitored. Monitoring demonstrates that loach minnow and spikedace persist in the Aravaipa Creek area, the populations are likely stable throughout the system, and populations are robust enough under current management to sustain the short-term, adverse effects described herein.

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

INCIDENTAL TAKE STATEMENT

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

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

Amount Or Extent Of Take

We anticipate that some spinedace and loach minnow will be taken as a result of this proposed action. The incidental take is expected to be in the form of direct mortality, harm, and harassment. Take in the form of direct mortality could occur from running over fish and eggs by vehicles and equipment in the crossings. Take in the form of harm could occur due to changes in fish habitat (i.e. increased sedimentation during reestablishment of creek crossings) that are likely to cause death or injury of spinedace and loach minnow eggs. Take in the form of harassment could also occur from disturbance of fish or their habitat by vehicles in the crossings, removal of large debris, and altering physical characteristics adjacent to the creeks. We anticipate that any take that occurs will be at low levels. We anticipate that incidental take will be difficult to detect as these species have a small body size, finding a dead or impaired specimen is unlikely, losses may be masked by seasonal fluctuations in numbers from other causes, scavenging of dead animals is likely to occur, and other reasons. As a surrogate measure of take, we will consider incidental take to be exceeded if the following occurs:

Ongoing twice-annual spinedace and loach minnow monitoring or project site monitoring by BLM personnel shows an effect or effects to the populations or their habitat attributable to the proposed action that are greater than anticipated herein.

EFFECT OF THE TAKE

In this biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the loach minnow or spikedace. The implementation of the proposed action, along with the conservation measures, will ensure that, while incidental take may still occur, it is minimized to the extent that habitat quality and quantity will be maintained in the planning area and species will be conserved.

REASONABLE AND PRUDENT MEASURES

Due to the conservation measures that are part of the proposed action, no reasonable or prudent measures are necessary to further minimize incidental take. However, to adequately assess the effectiveness of the conservation measures in minimizing incidental take, you shall monitor as described above and report to us the finding of that monitoring. You shall submit a report to the Arizona Ecological Services Office within 30 days after completion of the proposed action. This report will briefly document the effectiveness of the conservation measures, locations of any loach minnow or spikedace observed, and, if any are found dead, the suspected cause of mortality. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information, and the BLM must immediately provide an explanation of the causes of the taking and review with us the need for possible provision of reasonable and prudent measure(s).

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) 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. The recommendations provided here do not necessarily represent complete fulfillment of the BLM's section 2(c) or 7(a)(1) responsibility for these species. In furtherance of the purposes of the Act, we recommend implementing these discretionary actions.

Loach Minnow and Spikedace

We recommend that you:

1. Continue to support inventories and monitoring of loach minnow and spikedace habitats.

This could include un-surveyed and incompletely surveyed sites.

2. Collect flow data to apply for instream flow rights with the Arizona Department of Water Resources in occupied and un-occupied suitable loach minnow and spinedace habitats if such rights have not been previously obtained.
3. Work with us to implement the recovery plans for these species, including establishment of new populations where appropriate.
4. Coordinate with the Arizona Game and Fish Department and us to begin an aggressive program to control non-native aquatic species on BLM lands.

In order for us 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.

REINITIATION NOTICE

This concludes formal consultation on the proposed action as described in the requests. 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 your efforts to identify and minimize effects to listed species from this project. For further information please contact Mark Crites (520) 670-6150 (x229) or Jim Rorabaugh (520) 670-6150 (x230). Please refer to consultation number 22410-2007-F-0224 in future correspondence concerning this project.

/s/ Field Supervisor

cc: Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
 State Director, Bureau of Land Management, Phoenix, AZ

Habitat Branch Chief, Bob Broscheid, Arizona Game and Fish Department, Phoenix, AZ
 Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

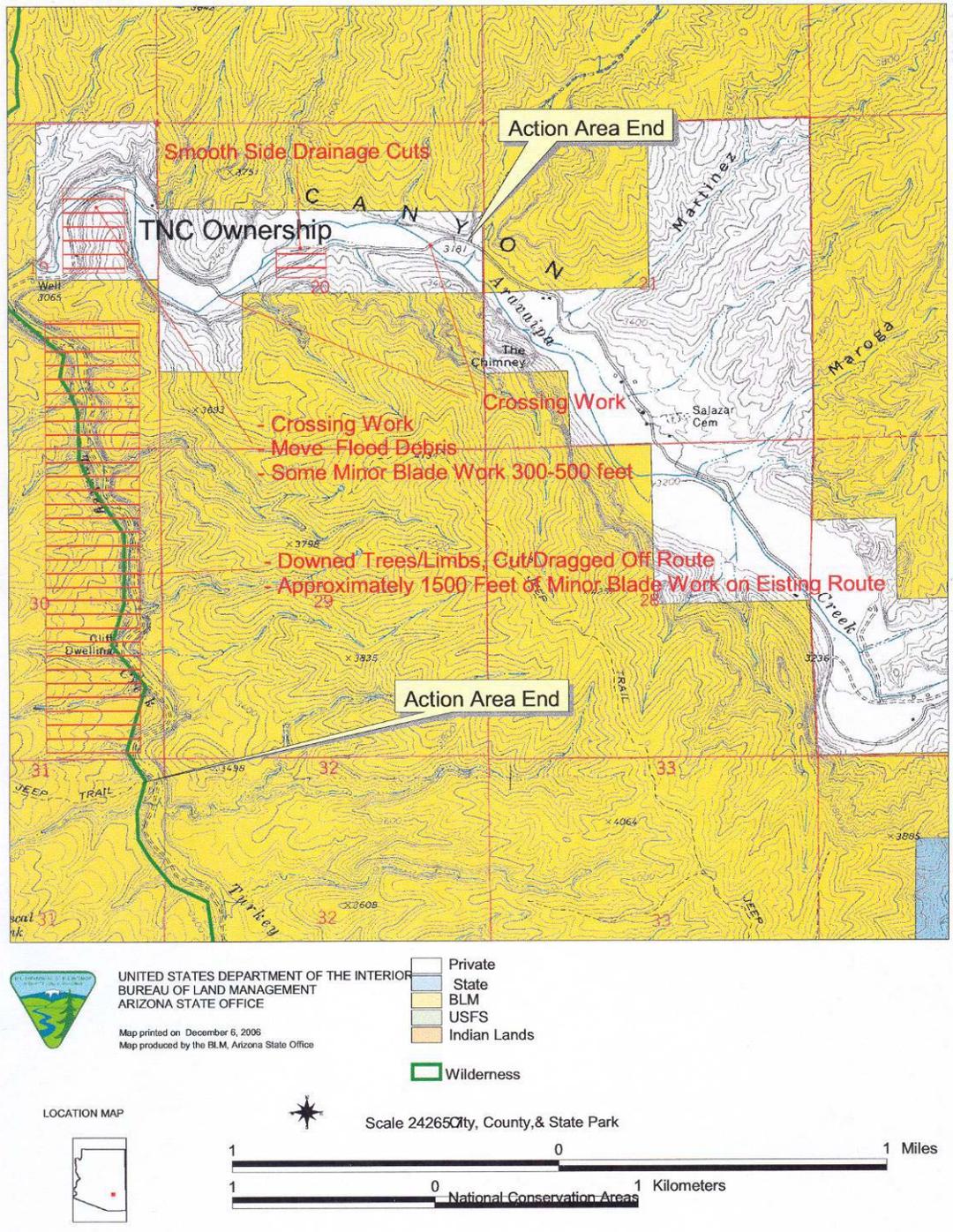
Literature Cited

- Abarca, F.J. 1987. Seasonal and diet patterns of feeding in loach minnow (*Tiaroga cobitis* Girard). *Proceedings of the Desert Fishes Council* 20:20.
- Anderson, R.M. 1978. The distribution and aspects of the life history of *Meda fulgida* in New Mexico. MS Thesis. New Mexico State University, Las Cruces. 62 pp.
- Bagley, B.E., G.W. Knowles, and T.C. Inman. 1995. Fisheries surveys of the Apache-Sitgreaves National Forests, trip reports 1-9. May 1994 to September 1995. Arizona State University, Tempe, Arizona. 50 pp.
- Barber, W.E. and W.L. Minckley. 1966. Fishes of Aravaipa Creek, Graham and Pinal Counties, Arizona. *The Southwestern Naturalist* 11(3):313-324.
- Barber, W.E. and W.L. Minckley. 1983. Feeding ecology of a southwestern Cyprinid fish, the spikedace, *Meda fulgida* Girard. *The Southwestern Naturalist* 28(1):33-40.
- Barber, W.E., D.C. Williams, and W.L. Minckley. 1970. Biology of the Gila spikedace, *Meda fulgida*, in Arizona. *Copeia* 1970(1):9-18.
- Britt, K.D. 1982. The reproductive biology and aspects of the life history of *Tiaroga cobitis* in southwestern New Mexico. New Mexico State University, Las Cruces. 56 pp.
- Douglas, M.E., P.C. Marsh, and W.L. Minckley. 1994. Indigenous fishes of western North America and the hypothesis of competitive displacement: *Meda fulgida* (Cyprinidae) as a case study. *Copeia* 1994(1):9-19.
- Jakle, M. 1992. Memo February 26, 1992 - Summary of fish and water quality sampling along the San Pedro River from Dudleyville to Hughes Ranch near Cascabel, October 24 and 25, 1992, and the Gila River from Coolidge Dam to Ashurst/Hayden Diversion Dam, October 28 - 31, 1991. U.S. Bureau of Reclamation, Phoenix, Arizona. 11 pp.
- Knowles, G.W. 1994. Fisheries survey of the Apache-Sitgreaves National Forests, third trip report: Eagle Creek, June 05 - 07 and August 02, 1994. Arizona State University, Tempe, Arizona. 6 pp.
- Marsh, P.C., F.J. Abarca, M.E. Douglas, and W.L. Minckley. 1989. Spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*) relative to introduced red shiner (*Cyprinella lutrensis*). Arizona Game and Fish Department, Phoenix, Arizona. 116 pp.
- Marsh, P.C., J.E. Brooks, D.A. Hendrickson, and W.L. Minckley. 1990. Fishes of Eagle Creek, Arizona, with records for threatened spikedace and loach minnow (Cyprinidae). *Journal of the Arizona-Nevada Academy of Science* 23(2):107-116.
- Miller, R.R. 1961. Man and the changing fish fauna of the American southwest. *Papers of the Michigan Academy of Science, Arts, and Letters* XLVI:365-404.
- Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Phoenix, Arizona. 293 pp.

- Propst, D.L. and B.R Bestgen. 1991. Habitat and ecology of the loach minnow, *Tiaroga cobitis*, in New Mexico. *Copeia* 1991(1):29-38.
- Propst, D.L. K.R. Bestgen, and C.W. Painter. 1988. Distribution, status, biology, and conservation of the loach minnow (*Tiaroga cobitis*) Girard in New Mexico. U.S. Fish and Wildlife Service Endangered Species Report 17, Albuquerque, New Mexico. 75 pp.
- Propst, D.L., K.R. Bestgen, and C.W. Painter. 1986. Distribution, status, biology, and conservation of the spikedace (*Meda fulgida*) in New Mexico. Endangered Species Report No. 15. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 93 pp.
- Rinne, J.N. 1989. Physical habitat use by loach minnow, *Tiaroga cobitis* (Pisces: Cyprinidae), in southwestern desert streams. *The Southwestern Naturalist* 34(1):109-117.
- Rinne, J.N. 1999. The status of spikedace (*Meda fulgida*) in the Verde River, 1999: implications for management and research. *Hydrology and Water Resources of Arizona and the Southwest*. Proceedings of the 1999 meetings of the hydrology section, Arizona-Nevada Academy of Science, Volume 29.
- Rinne, J.N., and E. Kroeger. 1988. Physical habitat use by spikedace, *Meda fulgida*, in Aravaipa Creek, Arizona. *Proceedings of the Western Association of Fish and Wildlife Agencies Agenda* 68:1-10.
- Schreiber, D.C. 1978. Feeding interrelationships of fishes of Aravaipa Creek, Arizona. Arizona State University, Tempe, Arizona. 312 pp.
- Sublette, J.E., M.D. Hatch, and M. Sublette. 1990. *The fishes of New Mexico*. University of New Mexico Press, Albuquerque, New Mexico. 393 pp.
- Tibbets, C.A. 1992. Allozyme variation in populations of the spikedace *Meda fulgida* and the loach minnow *Tiaroga cobitis*. *Proceedings of the Desert Fishes Council* 24:37.
- Tibbets, C.A. 1993. Patterns of genetic variation in three cyprinid fishes native to the American southwest. MS Thesis. Arizona State University, Tempe, Arizona. 127 pp.
- U.S. Fish and Wildlife Service. 1991a. Spikedace (*Meda fulgida*) recovery plan, September 1991. Region 2, U. S. Fish and Wildlife Service, Albuquerque, New Mexico. 38 pp.
- U.S. Fish and Wildlife Service. 1991b. Loach minnow (*Tiaroga cobitis*) recovery plan, September 1991. Region 2, U. S. Fish and Wildlife Service, Albuquerque, New Mexico. 38 pp.
- U.S. Fish and Wildlife Service. 1994. Notice of 90-day and 12-month findings on a petition to reclassify spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*) from threatened to endangered. *Federal Register* 59(131):35303-35304. July 11, 1994.
- Vives, S.P. and W.L. Minckley. 1990. Autumn spawning and other reproductive notes on loach minnow, a threatened cyprinid fish of the American southwest. *The Southwestern Naturalist* 35(4):451-454.
- Williams, J.E., D.B. Bowman, J.E. Brooks, A.A. Echelle, R.J. Edwards, D.A. Hendrickson, and J.J. Landye. 1985. Endangered aquatic ecosystems in North American deserts with a list of

vanishing fishes of the region. *Journal of the Arizona-Nevada Academy of Science* 20(1):1-62.

Turkey Creek Route Maintenance



Map 1: Locations of project features.

Appendix: Project area photos.



Photo 1 - Current route used by the public, just up stream of the confluence of Turkey Creek.



Photo 2 – The road avoided the active channel by passing between the two trees in the background. Debris in the foreground would need to be moved and some blade work done so that traffic could be routed back on to the road.



Photo 3 – Old road bed looking upstream to the two cottonwood trees (see Photo 2). Some blade work would have to be done on this stretch to re-define the road.



Photo 4 and 5 – Examples of downed trees and limbs that need to be moved to open the road in Turkey Creek.



Photo 6 – Example of a creek crossing in Turkey Creek that would need some blade work to remove large rocks and to decrease the steepness of the bank.



Photo 7 – Head cut at Turkey Creek Corrals. Blade work would be needed here to reopen the road.