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U.S. Fish and Wildlife Service
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2-21-93-F-166

October 20, 1993

Mr. Humberto Hernandez
State Conservationist
Soil Conservation Service
201 East Indianola Avenue Suite 200
Phoenix, Arizona 85012-2054

Dear Mr. Hernandez:

This responds to your request of August 4, 1993, for formal section 7 consultation with the Fish and Wildlife Service (Service) pursuant to the Endangered Species Act (Act) of 1973, as amended, on the Emergency Watershed Protection project at The Nature Conservancy (TNC) residence on Aravaipa Creek in Graham County, Arizona. The species potentially affected by this action are the threatened spikedace (Meda fulgida) and loach minnow (Tiaroga cobitis). The project is within the boundaries of the proposed critical habitat for these two fish species.

This biological opinion was prepared using information contained in the biological evaluation, other letters and documents exchanged between the Soil Conservation Service (SCS) and the Service, discussions and field meetings with interested agencies, data in our files or in the published or grey literature, and other sources of information.

The 90-day consultation period began on August 6, 1993, the date your request was received by the Arizona Ecological Service State Office. Notice of that receipt was sent to you in a memorandum dated August 12, 1993.

BIOLOGICAL OPINION

It is the Service's biological opinion that the Emergency Watershed Protection project at TNC residence on Aravaipa Creek is not likely to jeopardize the continued existence of the threatened spikedace or loach minnow. Proposed critical habitat was not destroyed or adversely modified by the project.

BACKGROUND INFORMATION

Consultation History

High water flows in Aravaipa Creek in the winter of 1992-1993 resulted in erosion along the stream bank at TNC property. The SCS evaluated the incident and determined that an emergency situation existed and the project would qualify for the Emergency Watershed Protection program. The SCS contacted the Service on January 24, 1993 concerning the project. Emergency consultation was requested on February 26, 1993. In a letter from the Service to SCS dated March 10, 1993, four measures to reduce incidental take from the implementation of the project

were specified. These measures were to be part of the Clean Water Act Section 404 permit issued for the project. These measures were:

1. Minimize the use of machinery in flowing or standing water;
2. Minimize the downstream transport of sediment from the construction area;
3. Minimize removal of fallen trees and downed vegetation from the stream and riparian zone; and
4. A biologist should be present during all on-site construction activities.

Because this project qualified as an emergency action, formal section 7 consultation was not completed prior to construction. The project was completed after the SCS, and the Service had consulted informally.

Description of the Action

The project involved removing tree debris, re-creating a sloping bank by moving material from the channel to the south bank, and then the dumping of approximately 525 linear feet of rock riprap on the new sloping bank. Prior to construction work on the streambank, the flow of Aravaipa Creek was diverted towards the north bank, out of the construction area. Construction could then take place in the dry portion of the channel. A trench at the toe of the slope was dug and filled with additional rock. The SCS proposes to plant native cottonwoods and willows along the south bank to replace riparian values lost during the high flows. The planting will be accomplished after November 15, 1993.

Small (4 feet by 10 feet in size) settling ponds were hand built near the construction site. Water from the trench at the toe of the bank was pumped into them and allowed to clear before it was discharged into the creek. This reduced the amount of sediment reaching the creek from the construction area.

Description of the Project Area

Aravaipa Creek is a tributary of the San Pedro River in southeast Arizona. The drainage basin includes portion of Graham and Pinal Counties. Land owners in the basin include the Bureau of Land Management, U.S. Forest Service, State of Arizona, and private entities. The project area is on land owned by TNC, an organization that purchases areas of unique biological resources and maintains them as preserves. The lower end of Aravaipa Creek near the confluence with the San Pedro River is intermittent; however, the creek is perennial through the project area.

In the project area, Aravaipa Creek is dominated by shallow runs with sand, gravel and pebble dominated substrates. Riffles comprise the remaining available aquatic habitat. Riffles are dominated by boulder, cobble and pebble substrates (Arizona Game and Fish Department 1992). Native fish species dominate the fish fauna.

Species Description

Spikedace

The following summary is taken from the Spikedace Recovery Plan (USFWS 1991a). For more detailed information on the biology of this species and additional scientific references, please consult the recovery plan.

The spikedace is part of the endemic fish fauna of the Gila River basin. Populations have declined to where the species is only found in several isolated areas of its former range in Arizona and New Mexico (Propst et al. 1986). Spikedace typically occupy small to moderate size streams or the mouths of tributaries in larger rivers. Flowing waters of usually less than one meter in depth over gravel/sand bars, downstream edges of riffles, or shear zones are typical adult habitat while younger age classes are more often found near pool margins over fine grained substrates (Anderson 1978, Rinne 1985, Propst et al. 1986, Propst and Bestgen 1986, Rinne and Kroeger 1988, Rinne 1991). Shallow sand/gravel riffles are used for spawning. Eggs likely adhere to the substrate. The primary spawning period is April to June (Anderson 1978, Propst et al. 1986).

Loach Minnow

The following summary is taken from the Loach Minnow Recovery Plan (USFWS 1991b). For more detailed information on the biology of this species and additional scientific references, please consult the recovery plan.

The loach minnow is part of the endemic fish fauna of the Gila River basin. Populations have declined to where the species is only found in several isolated areas of its former range in Arizona and New Mexico (Minckley 1973, 1985, Propst et al. 1988). Loach minnow typically inhabit turbulent rocky riffles of mainstem rivers and tributaries. Shallow waters, moderate to swift currents and gravel to cobble substrates are features of the habitat. A bottom dweller, the loach minnow utilizes the spaces and shelter available in these substrates (Barber and Minckley 1966, Minckley 1973, Propst et al. 1988, Rinne 1989, Propst and Bestgen 1991). During the spawning period from late March to early June, adhesive eggs are deposited in cavities under flattened rocks.

Environmental Baseline

The environmental baseline serves to define the current status of the listed species and its habitat to provide a platform to assess the effects of the action now under consultation. While it is clearly focused on the action area, it is important to include in this definition the status of the listed species throughout its range as well as in the action area. Any evaluation of the effects of the action must be made in the context of species status overall.

The environmental baseline is developed using past and present impacts of all Federal, State, or private actions and other human activities 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 or private actions which are contemporaneous with the consultation process. It also includes similar information from species habitats outside of the action area

In the action area, consultation has been completed on the Emergency Watershed Protection project at the Jep White residence, an SCS project downstream of TNC project. The Jep White project also involved the placement of rip-rap along an eroding bank to protect structures. There were other streambank areas along Aravaipa Creek disturbed by the high flows of 1993; however, the SCS has not been involved in any actions at those locations and no section 404 permit applications have been forwarded to the Service by the Corps of Engineers.

Impacts of human activities on the watersheds supporting the occupied streams continue. Water diversions and return flows, livestock grazing, timber harvest and changes in annual flows due to dams have significantly impaired the ability of the aquatic habitats to support these fish.

Consultation on timber sales on the Apache-Sitgreaves National Forest has been completed for the loach minnow. Measures to reduce sedimentation into the stream are included under the Incidental Take statement in that opinion. Those measures do not address any existing degraded conditions but attempt to prevent further loss of habitat quality. The effects of livestock grazing and other human activities on fish habitat has not yet been subject to section 7 consultation, but the probable effects of these activities on habitat for the spikedace and loach minnow have been acknowledged.

The remaining spikedace and loach minnow populations cannot be considered secure. The populations are in stream reaches isolated from each other and this increases the risks to population stability from habitat degradation since natural recolonization is not possible. Habitat degradation continues to adversely affect these habitats. The presence of non-native fish species in the habitats of these fishes has exacerbated the adverse effects of degraded habitat. As there are no pristine physical habitats left to support the spikedace and loach minnow, there is no certain refuge for these species from the incursions of non-native species. Even in Aravaipa Creek, considered to be a native fish stronghold by fishery researchers, non-native fish species have recently been found in some areas.

The spikedace and loach minnow were listed as threatened species in 1986. Since that time, substantial improvement in the status of these species has not occurred. Whether the status has declined since 1986 is a matter of conjecture. Stresses to the habitat and individuals from cyclical wet and dry years likely have an affect on the local populations. What is clear, however, is that these species remain only in small, isolated populations all of which face continuing threats from human activities. Continued degradation of the habitat is not in the interest of the survival or recovery of these species.

EFFECTS OF THE ACTION

Direct and Indirect Effects

As described earlier in this document, this project was completed prior to the initiation of formal section 7 consultation. Thus, all direct and some indirect effects from the project have already occurred. The magnitude of those effects has not been determined. This document will only describe the effects likely to have occurred in general terms, since the actual extent is not known.

The relocation of the creek flow out of the construction area minimized the input of sediment to the stream that would have resulted from the construction activity. Depending upon how the active channel was relocated, there may have been some increase in sediment from that action. If the stream flow eventually moves back toward the south bank, there may be an increase in sediment load from the disturbed substrates. Use of the settlement ponds further reduced the opportunity for increases in sediment to reach the creek. The bank against which the rip-rap was placed was not rock or gravel, but soil that was more likely to create additional sediment loads as erosion continued. The new rock face over that soil may reduce the ability of this section of bank to contribute sediment, but any changes in stream hydraulics that may result may exacerbate a sediment source elsewhere. The actual amount of increased sedimentation resulting from this project is not possible to quantify. The measures taken to reduce the likelihood of any increase in sediment load hopefully minimized this effect.

Suspended sediment affects water clarity and may adversely affect the ability of sight-feeding fish to locate floating prey items. The spikedace could have been more directly affected by the suspended sediment since it feeds in the water column. As the sediment was deposited, benthic

invertebrates preyed on by the loach minnow may have been adversely affected. The sediment load being carried at the time of the construction is unknown, so the percentage increase cannot be determined. This increase was likely not permanent, and the presence of long term effects from the increase is very difficult to determine. It was fortunate that the construction was completed prior to the spawning season for both species and that flows in the creek were likely sufficient to carry the increased sediment downstream and out of spikedace and loach minnow habitats.

There may have been actual losses of both spikedace and loach minnow due to crushing by construction equipment and desiccation after the stream was diverted. Loach minnow are more vulnerable to this effect than the spikedace due to their bottom-dwelling habits. Because the amount of loach minnow preferred substrates in the project area is limited, it would be expected that the risk to this species was reduced. The water-column dwelling spikedace have some potential to evade equipment in the creek. The use of equipment in the creek was limited to minimize the potential for fish losses.

Both of these fish species utilize hard substrates (sand to cobble) as part of their habitat. Placement of additional rocks in the stream will not likely result in degradation of the substrate over the long term. Depending upon the effectiveness of the rip-rap in controlling bank erosion, the decrease in sediment input from this section of the creek may have some benefit. However, it is important not to confuse the importance of unaltered streambanks in a natural floodplain with the altered, armored bank. Natural banks have a diversity of microhabitats that are often preferred by fish species. Interference with the normal sinuosity of a waterway moving across its floodplain changes the dynamic condition of the waterway in ways that may be very significant to the health of the aquatic systems over time.

Effects to Survival and Recovery

Completion of this project creates an additional reach of modified bank and may impair creek dynamics over the long term. Because of the extent and type of modification resulting from the project, there have been effects to the proposed critical habitat. However, these effects are not significant enough in themselves to warrant a finding of destruction or adverse modification of critical habitat. This may not be true of other such projects in the future. Aravaipa Creek is a very important part of both the survival and recovery opportunities for these fish. Continued alterations to the natural habitat by projects such as this may result in reducing the value of this creek for the spikedace and loach minnow. Given the status of these species elsewhere in their range, reducing the effectiveness of the Aravaipa Creek habitats is not in the best interests of these species.

Cumulative Effects

Cumulative effects are those effects of future State or private activities that have no Federal connection, that are reasonably certain to occur within the action area of the Federal action subject to consultation.

It is anticipated that the ongoing private actions described in the environmental baseline will continue in the action area. Any other flood control or bank stabilization work in Aravaipa Creek could require a Clean Water Act, section 404 permit to proceed, and therefore, could have a Federal connection. Additional State or private activities are not immediately foreseen for the action area.

INCIDENTAL TAKE

Section 9 of the Act, as amended, prohibits the taking (harass, harm, pursue, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species without a special exemption. The concept of harm includes significant habitat modification and degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding or sheltering. Case law has affirmed that taking does harm to listed threatened species when there is definable injury or death to individuals. 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 taking within the bounds of the Act, provided such taking is in compliance with the incidental take statement provided in the biological opinion.

The Service has determined that the implementation of the action may have taken an unknown number of individual loach minnow and spikedace. In addition, habitat disturbances resulting from diverting the creek, shifting of substrates, sedimentation, and placement of rip-rap occurred in the action area and for some distance downstream. It is not possible to quantify the numbers of individual fish that may have been taken by the action.

The Service had recommended four measures to minimize the take in our letter dated March 10, 1993. We understand that SCS did implement these measures during the construction. The Service has no additional reasonable and prudent measures or terms and conditions to further minimize the take.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for the species.

As this project has been completed, it is difficult to provide further recommendations to limit adverse impacts. However, the Service would like to recommend to SCS that they evaluate the rip-rap project for possible habitat enhancement and restorative measures that would provide additional fish habitats in the action area.

CONCLUSION

This concludes formal section 7 consultation on the emergency Watershed Protection Project: TNC residence, as outlined in your February 23, 1993 request. As required by CFR 402.16, reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is exceeded, 2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion, or 4) a new species is listed or critical habitat designated that may be affected by the agency action.

Mr. Humberto Hernandez

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Thank you for assisting us in the conservation of endangered and threatened species. In future communications on this project, please refer to consultation number 2-21-93-F-166. If we may be of assistance, please contact Sally Stefferud, Lesley Fitzpatrick or Tom Gatz.

Sincerely,

/s/ Sam F. Spiller
State Supervisor

cc: Chief, Fish and Wildlife Service, Arlington, Virginia (DES)
Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico
(AES)
Director, Arizona Game and Fish Department, Phoenix, Arizona

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