

**United States Department of the Interior**

**U.S. Fish and Wildlife Service**

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In Reply Refer To:

AESO/SE

22410-2007-F-0233R1

CCN 2011-77

November 17, 2010

Email Transmission

Memorandum

To: Chief, Environmental Resource Management Division, Bureau of Reclamation,  
Glendale, Arizona

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

From: Field Supervisor

Subject: Biological Opinion for Reinitiation of Section 7 Consultation for Rotenone  
Application and Related Native Fish Management Actions in Bonita Creek, Arizona

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request, dated September 29, 2010, was received by us on November 3, 2010. At issue are impacts that may result from the proposed rotenone application and related native fish and habitat management actions in Bonita Creek, Graham County, Arizona. Because the action is virtually identical to and is a continuation of an action that we previously consulted on (June 28, 2007), we consider this request to be a reinitiation of consultation. The proposed action may affect endangered Gila chub (*Gila intermedia*), endangered Gila topminnow (*Poeciliopsis occidentalis*), endangered desert pupfish (*Cyprinodon macularius*), threatened loach minnow (*Tiaroga cobitis*), and threatened spikedace (*Meda fulgida*). Both the loach minnow and spikedace have been proposed for uplisting to endangered status and have proposed critical habitat (75 FR 66482) in Bonita Creek.

As requested, this biological opinion (BO) includes the proposed action to re-renovate Bonita Creek and to fill with sediment an area of ponded water immediately upstream of the existing barrier. All proposed actions in the previous BO are still covered by our original section 7 consultation and will not be referred to here. The original BO envisioned only one piscicide treatment. Because an additional piscicide treatment is planned and others may be needed, additional section 7 consultation is needed. Therefore, as delineated in the proposed action below, this BO covers the effects of one or more additional rotenone applications to Bonita Creek. The capture, transport, propagation, and release of the five listed fish will be covered by Section 10(a)(1)(A) Recovery Permits for Arizona Game and Fish Department and other cooperating agencies.

You also indicated that you expect the project will not affect either the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), or the threatened bald eagle (*Haliaeetus leucocephalus*). The bald eagle has been delisted. You will conduct surveys this spring and request expedited consultation if the flycatcher is detected. We concur with your determination for reasons explained in Appendix A.

This biological opinion is based on information provided in the September 2010, biological assessment (U.S. Bureau of Reclamation [USBR] and U.S. Bureau of Land Management [BLM] 2010), the April 2010, draft environmental assessment (USBR 2010b), and other sources of information, all of which are incorporated by reference. References cited in this biological opinion are not a complete bibliography of all references available on the species of concern, stream restoration, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at our Phoenix office.

### **CONSULTATION HISTORY**

The consultation history after the 2007 BO:

2009:

Multiple conversations via telephone, electronic mail, Central Arizona Project (CAP) program meetings, and Native Fish Conservation Team meetings regarding the discovery of nonnative fish in Bonita Creek after the first piscicide treatment.

February 10, 2010:

We received your request for formal consultation including your biological assessment of the proposed project.

April 12, 2010:

We received your draft Environmental Assessment of the proposed project.

April 16, 2010:

We received comments on an informal draft BO from R. Clarkson of USBR (pers. comm.)

May 27, 2010:

We received your request to withdraw your request for consultation. This was done to add the actions to fill in the pool behind the barrier to the proposed action for consultation.

November 3, 2010:

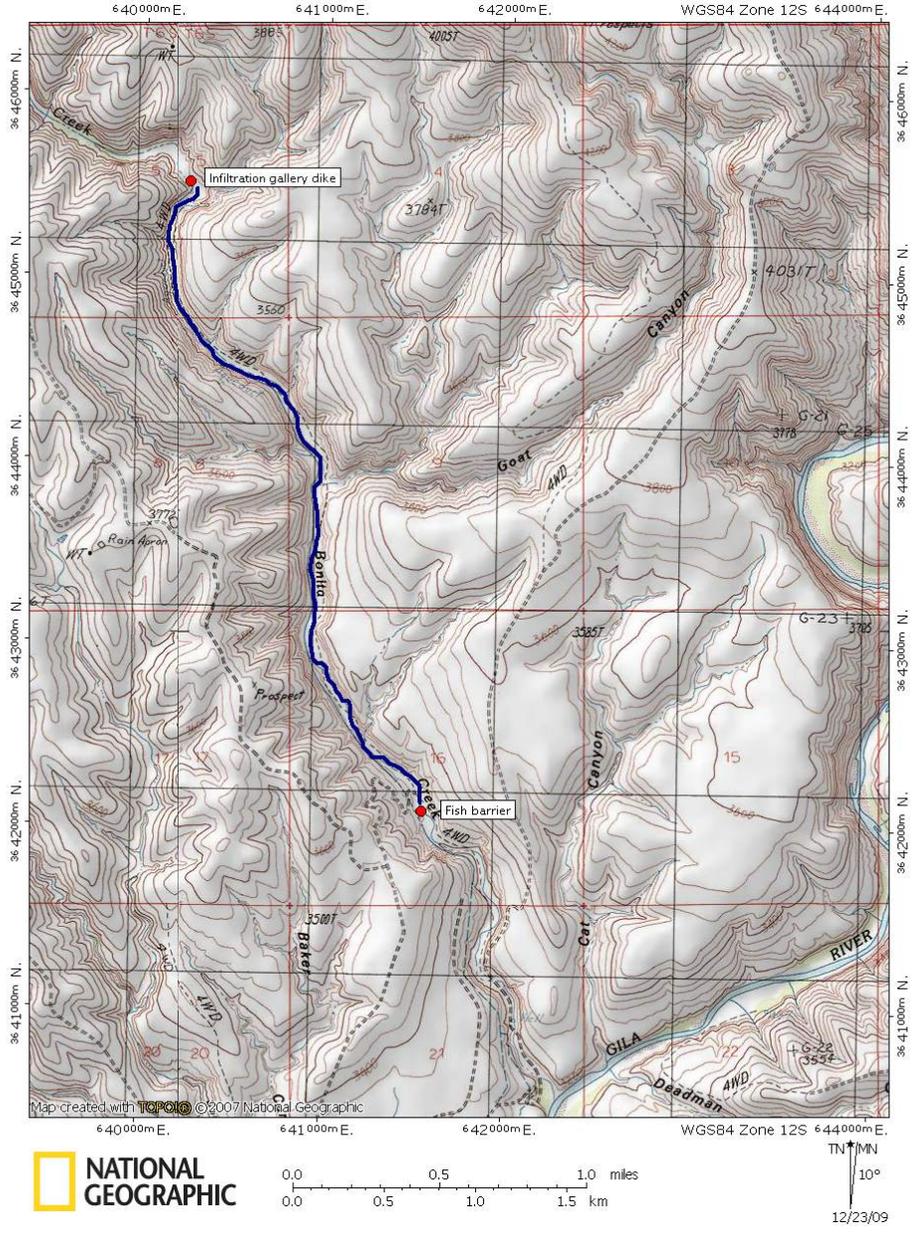
We received your request for formal consultation including your biological assessment of the proposed project.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

The proposed action continues a project to enhance the native fish community in Bonita Creek, Graham County, Arizona. One or more chemical removals of nonnative fish between 2011 and 2016 are proposed by the USBR, the BLM, Arizona Game and Fish Department (AGFD), and their partners; one removal is planned for 2011. Native fishes and aquatic invertebrates will be removed prior to piscicide application and repatriated to Bonita Creek following renovation. The purposeful capture, transport, and other forms of intentional take associated with salvage, repatriation of listed fish species, and monitoring activities, will be covered under 10(a)(1)(A) permits as noted previously so these activities are not covered under this consultation. The sediment fill will likely take place in early 2011, necessarily before any chemical removals occur. The entire project is part of a conservation measure by the USBR under the revised BO on the transportation and delivery of Central Arizona Project water to the Gila River basin (FWS 2008). In addition, the project is consistent with the guidance document for CAP native fish activities under the Gila River Basin Native Fish Conservation Program (FWS et al. 2008). This project is largely funded by the USBR and implemented on lands administered by the BLM, and is intended to be beneficial to native fishes and the whole ecosystem by removing nonnative fishes that prey on and compete with native fishes, thereby maintaining and protecting an intact native fish assemblage free from nonnative fishes. The consultation period is 2010 through 2016, which is the time covered by the MOU between BLM and the City of Safford, signed in October, 2006.

Figure 1. Reach of Bonita Creek to be re-renovated (blue), showing the locations of the infiltration gallery dike and fish barrier.



During the course of barrier construction, USBR attempts to backfill behind its barriers to minimize the formation of an impoundment, but sufficient construction fill is not always available. For the Bonita Creek barrier, USBR was unable to backfill the channel completely using existing materials. It was assumed that a flood of sufficient magnitude to naturally fill in sediment behind the barrier (estimated two-year recurrence interval flood of 2,320 cubic feet per second) would fill in behind the barrier; however, this has not yet occurred at Bonita Creek and active measures to add the sediment are needed.

A large volume of impounded water adds considerably to both the amount (and cost) of piscicide required for treatment as well as complexity of the treatment. It is especially difficult to apply piscicide effectively to deep waters, and deep waters may also obscure complex habitats that would require special consideration during the piscicide application process. Justification for adding sediment upstream of the fish barrier before the planned re-renovation include: (1) native fishes that were repatriated to Bonita Creek are undoubtedly declining as nonnative populations increase, and we need to act now to stem further losses; (2) the Bonita Creek fish barrier is fully functional except for this one problem, and management agencies are ready to proceed with native fish recovery actions; (3) agencies cannot chance another renovation with the ponding due to a high potential for failure resulting from both an ineffective treatment and the likelihood for human-assisted transfers of nonnatives; (4) there is no certainty when a natural flood capable of filling the ponded area will occur; (5) the integrity of the Safford infiltration gallery dike is not certain, and if the nonnative fishes now present below it get above it, the stream will be lost for natives unless a very expensive and controversial chemical treatment of the entire stream (including a significant portion on the San Carlos Apache Reservation) could be applied; and (6) the City of Safford per their 10-Year Operations Plan and rights-of-way terms, conditions, and stipulations shall continue to have the right to maintain, operate, construct, repair, replace, expand, and monitor all municipal water system facilities in Bonita Creek. Current conditions above the barrier hinder their operations.

The proposed project would fill a portion of the low lying area upstream of the Bonita Creek fish barrier by importing and placing fill there. The fill area includes an abandoned channel now cut off by the barrier, and the road alignment leading up to the vehicle ramp (Figure 2). Both areas are located to the right (west) of the active thalweg. These areas are currently inundated by water due to the increased water surface elevation in the channel resulting from the fish barrier and the existence of a beaver dam upstream of the low flow notch in the barrier.



Figure 2. Area of fill at the barrier in Bonita Creek, Arizona.

About 1,800 cubic yards (cy) of material would be purchased from an established source (operated since 1929) near Safford and imported to the site in dump trucks. Imported material would be a mixture of sand and gravel from near Safford. We anticipate that material would be hauled by the BLM Force Account crew. Fill would be discharged at various locations near the intended fill area to limit the amount of handling required at the site. Once discharged at the site, the stockpiled material would be spread using BLM heavy equipment.

Fill placement will slope from channel right toward the active thalweg, ending near the road alignment and thus not coming into contact with the stream. The elevation ranges from one foot above the barrier notch elevation at channel right to the notch elevation at the road alignment. These elevations produce fill depths ranging from a few inches to over five feet. Once imported and spread at the site, the fill is estimated to cover an area of 0.64 acres.

To eliminate suspended sediment concentration and turbidity increases in Bonita Creek, the site will be dewatered before fill placement. Full dewatering, including diversion of the active flow, is not required since partially dewatering the site will eliminate a hydraulic connection to the creek. Partial dewatering will be accomplished by first removing any beaver dams that increase the water surface near the work. Once the dams are removed, the water surface should diminish to the typical ground water elevation in the area or approximately the barrier notch elevation. With the water surface at this elevation, access with equipment should be possible and no hydraulic connection should remain with the active channel. However, if additional dewatering is required, the use of temporary pump equipment will be necessary. Before fill is placed, native fishes and aquatic invertebrates would be salvaged and relocated as described in the next section.

The duration of the work is dependent on the number of trucks available for hauling material but is estimated to last four to five weeks using two available 10-cy trucks and assuming a two-hour round trip transit time per truck. Project duration will be shortened accordingly if additional haul trucks are available. Project duration assumes that sufficient crews are available to spread the material while the truck(s) is in transit from the material source.

Details of the proposed 2010 fish salvage and holding, chemical application and detoxification, and restocking of fishes in the treatment reach shown in Figure 1 are essentially identical to those in the 2007 BO and are not repeated here. That part of the proposed action from the 2007 BA (USBR 2007) and 2007 BO (FWS 2007) is incorporated here by reference. Potential re-application of piscicides after the 2010 treatment will be considered in the event of unsuccessful renovations (*i.e.*, failure to kill all non-native fishes in the reach), human-aided transfer of nonnatives upstream of the fish barrier after renovation, movement of fishes past the fish barrier due to its failure or other unforeseen event, or other unlikely but possible incidents that could result in an introduction of nonnative aquatic organisms upstream of the barrier. It is also possible that piscicide application to Bonita Creek upstream of the City of Safford infiltration gallery dike could become necessary depending on future events, and that is included as part of the proposed action. Mechanical removal of nonnative fishes using standard fishery gear may also be practiced anywhere in the stream below the San Carlos Apache Reservation boundary, depending on circumstances.

Disposition of salvaged fishes will also be different than described in the 2007 BA. Gila topminnow will not be salvaged alive in the 2010 treatment to ensure that they are not mixed with the similar-looking and problematic nonnative mosquitofish (*Gambusia affinis*) that have

reinvaded the reach. Poeciliids that are captured during salvage activities will be dispatched immediately ((10(a)(1)(A) activity), replaced to the stream alive to succumb later to the piscicides (section 7), or moved immediately downstream of the fish barrier (section 10). Gila topminnow could be salvaged and handled as other natives are during potential future renovations if the offending nonnative(s) to be targeted do not include mosquitofish.

It is possible that more fish could be salvaged than either the holding facilities at Bubbling Ponds Native Fishes Conservation Facility, other potential holding sites, or upper Bonita Creek could accommodate. Should that occur, those “excess” fishes would be stocked downstream of the fish barrier. Fish would not be reintroduced to the treated reach of Bonita Creek until October 2011 at the earliest and may not be reintroduced for up to a year. Salvaged fish would be cared for in the holding facilities until returned to the creek. If treatments are required in future years, reintroductions would also occur several months to a year or more after the treatment. Salvage goals for each fish species will be established in advance of any piscicide applications. Salvage of native amphibians and reptiles and aquatic invertebrates are included as part of the proposed action. The invertebrates would be returned to the creek once the rotenone is detoxified.

To facilitate effectiveness of rotenone applications, we anticipate that beaver dams within the treatment reach will be breached a few days before the renovations to drain pools.

Augmentations of repatriated or translocated species from appropriate sources are anticipated to occur during the first several years following the initial re-treatment period, but could occur any time during the foreseeable future until it has been determined, via monitoring, that the species have either established self-sustaining populations or are unlikely to result in successful establishment. Augmentation events may include releases of tens to thousands of individuals, depending on the species and source availability, at any locality or localities agreed on by partners upstream of the constructed fish barrier and downstream of the San Carlos Apache Reservation boundary.

## **STATUS OF THE SPECIES (rangewide)**

The status of the species is largely the same as summarized in the 2007 BO (FWS 2007). Differences between the species condition at the time of that BO and current conditions will be noted below. Multiple stockings of the listed species have been made since the 2007 BO (FWS 2007) (Table 1). Also, the following biological opinions can be referred to for discussions on the five species’ status:

- Repatriation of Gila topminnow into Sabino Creek (22410-2009-F-0143);
- Replacement of US 191 bridge (22410-2009-F-0017);
- Proposed forest uses and management of springs on Gila topminnow and desert pupfish (22410-2009-F-0462);
- Livestock grazing and management on the Fossil Creek range allotment (22410-2007-F-0197).
- In addition, spikedace were translocated to the Upper San Francisco River in New Mexico in 2008. No biological opinion was produced.

Our records indicate that, rangewide, 32 formal conferences or consultations have been completed or are underway for actions affecting Gila chub, 99 for actions affecting Gila

topminnow, 42 for actions affecting desert pupfish, 83 for actions affecting loach minnow, and 60 formal conferences or consultations have been completed or are underway for actions affecting spikedace.

## **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 consultation remains the same as described in the 2007 BO (FWS 2007). Significant changes to the environmental baseline as first described in the 2007 BO include construction of a fish exclusion barrier on lower Bonita Creek in 2008, which is intended to prevent upstream invasions of nonnative aquatic organisms, but also incidentally prevents upstream movements of native fishes. These and other effects of the barrier were described in the 2007 BO (FWS 2007).

In addition, several nonnative fishes were successfully removed from lower Bonita Creek as a result of the 2008 piscicide application, although mosquitofish, fathead minnow (*Pimephales promelas*), and green sunfish (*Lepomis cyanellus*) have re-established populations. Also, all of the species earlier proposed for translocation (spikedace, desert pupfish, loach minnow, and Gila topminnow) were stocked into the renovated reach during 2008, and spikedace in 2009 and desert pupfish, loach minnow, and Gila topminnow in 2010 were also translocated to Bonita Creek upstream of the City of Safford infiltration gallery. All species have been detected during subsequent monitoring. The native ichthyofauna that was extant in the renovated reach before the renovation (Gila chub, longfin dace [*Agosia chrysogaster*], speckled dace [*Rhinichthys osculus*], desert sucker [*Pantosteus clarki*], and Sonora sucker [*Catostomus insignis*]) were repatriated, but only subsets of the original populations were stocked. Although all species reproduced in spring 2009, a comparison of pre- and post-renovation population sizes cannot be made at this time.

### *Past Consultations in the Action Area*

The only additional formal consultations that have occurred since the 2007 BO (FWS 2007) have been three reinitiated consultations for the Safford/Tucson grazing BO (22410-1996-F-0169).

### **A. Status of the Species within the Action Area**

All five listed species were stocked to the renovated reach of Bonita Creek in 2008 and 2009. After the stocking events, surveys of the creek were done to verify if stocked fish or their progeny were present. Gila topminnow translocated in 2008 (n=975) established a tremendous population (perhaps numbering in the hundreds of thousands) in the lower reach immediately upstream of the fish barrier, but this population was diminished considerably by late summer 2009 due to partial stream desiccation resulting from drought, pumping of a City of Safford well, and expansion of a mosquitofish population (USBR and BLM 2010). A total of 678 loach

minnow were stocked into the renovated reach in 2008, and in 2009, inter-agency monitoring activities recaptured 20. There were 448 spinedace transported and stocked into the renovated reach in 2008 and 165 were stocked into the reach upstream of the infiltration gallery in 2009. Monitoring (only in the lower reach) thus far has detected 21 spinedace. A total of 147 desert pupfish were stocked into lower Bonita Creek in 2008, and monitoring thus far has detected their continued presence in the stream. The salvaged Gila chub repatriated to lower Bonita Creek in 2008 numbered 230, and in 2009, monitoring captured 179 (some the result of 2009 reproduction) (Robinson et al. 2009).

Critical habitat for spinedace and loach minnow in Bonita Creek was proposed on October 28, 2010 (75 FR 66482). The reach extends 14.8 miles upstream from the confluence with the Gila River and includes the proposed treatment reach. Bonita Creek contains suitable habitat for all ages of spinedace and loach minnow (physical and biological feature [PBF] 1); has an appropriate food base (PBF 2); and consists of perennial flow with no or low levels of pollutants (PBFs 3 and 4). There are nonnative species present in Bonita Creek that affect PBF 5; and the intent of the ongoing management is to remove these nonnative species to increase the ability of the proposed critical habitat to achieve conservation for the species.

## **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; all of these effects will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur. 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.

Proposed actions may affect the Gila chub, Gila topminnow, desert pupfish, spinedace, and loach minnow. Effects are expected to be both direct and indirect, and include beneficial, neutral, and adverse effects. Critical habitat for the spinedace and loach minnow was just proposed, and includes Bonita Creek.

Although the area to receive sediment fill will be dewatered, it is likely that small pools or puddles will still exist that could harbor fish. Although fish will be salvaged after the area is dewatered, it is highly likely that listed fish will still be present and killed when the fill is placed. In addition, Gila topminnow may not be salvaged, and they have a large population near the barrier. The removal of the pool behind the barrier will eliminate what is now an attractive nuisance and encourages the illegal release of nonnative fish.

The breaching of beaver dams is likely to cause adverse effects to individual fish and their habitat. It is possible that individual fish could be present at or near beaver dams, and suffer death or injury when dams are dismantled. The dismantling of beaver dams will cause the ponds behind the dams to be reduced, but not dewatered. This reduction in pool habitat is short-lived, as beavers quickly repair damage to their dams. Dismantling of the beaver dams will cause a short-term loss of habitat during piscicide treatments. It is also possible that individual fish could be stranded and die; however, beaver pond dismantling for the 2008 renovation and for

other actions has never completely dewatered a pond. Salvage of fish would occur before breaching of beaver dams, and would thus reduce the loss of listed fish due to the dam breaching.

Treatment with rotenone would affect approximately 1.7 miles of stream between the barrier and the Safford infiltration gallery dike. Mortality of individuals not captured during salvage operations (i.e., those that remain in the stream) is certain as a result of a renovation. Piscicide would not be applied downstream of the barrier or upstream of the infiltration gallery dike.

All of the federally-listed fishes of Bonita Creek likely will experience some unquantifiable level of mortality as a result of the proposed action. We anticipate that all Gila topminnow will be killed from the piscicide application unless some are moved downstream of the barrier, in which case an unquantifiable number may succumb to predation or competition by nonnative fishes. Sources of mortality to the other species could include salvage efforts, transport and holding activities, and piscicide application to individuals not salvaged. Pre-treatment monitoring assists in the development of salvage goals based on the estimated populations present in the area. Depending on the time between the monitoring and the salvage operation, the size of the fish populations may increase or decrease significantly, which affects the ability to meet the salvage goals and the number of fish remaining in the creek exposed to the treatment. Mortality caused by salvage, transport, and holding would be covered under AGFD's Section 10(a)(1)(A) permit. This mortality will diminish the supply of fishes to be repatriated back into Bonita Creek following the proposed and potential future unplanned renovations. However, the native fish populations (longfin dace, Gila topminnow, speckled dace, loach minnow, desert sucker, desert pupfish, Sonora sucker, Gila chub, spikedace) upstream of the infiltration gallery will be unaffected by the treatment proposed for 2011 and can serve as a source to increase the numbers of fish to be repatriated to the renovated reach. If future treatments include the reach above the infiltration gallery, there will be a reduced opportunity to use the area for placement of fish removed from the treatment reach during salvage operations. The number of fish that can be salvaged may be lower if this upper reach is also involved in a future treatment that includes the lower reach.

CFT Legumine™ is a formulation of rotenone, a naturally occurring substance derived from the roots of tropical plants in the Leguminosae family. Rotenone behaves like antimycin A by interfering with mitochondrial electron transport, and is a potent inhibitor of respiration in fish and other gill-bearing animals. Rotenone decomposes in light and water, with a half-life of 0.5 - 7.5 days at 5 to 20 degrees Celsius (°C). Toxicity is lowered with increased pH, water temperature, and organic matter. Dissipation is faster in flowing water due to dilution, dispersion and photolysis.

The formulation of CFT Legumine™ minimizes potential toxicity to applicators and non-target species from other chemicals in the product and also results in reduced detectability of the chemical by fish. Trace amounts of naphthalene, substituted benzenes, and hexanol have been identified in this formulation (Fisher 2007), as well as methyl pyrrolidone, diethylene glycol, monoethyl ether, fatty acid esters, and polyethylene glycols. These compounds are generally expected to rapidly biodegrade, hydrolyze, and/or photolyze, and are not considered bioaccumulative.

The Arizona Department of Agriculture issued a letter to AGFD in 2008 allowing for sodium permanganate or potassium permanganate to be used as a neutralizing agent with CFT

Legumine™. Neutralization of rotenone treatment will occur with application of the oxidizing agent sodium permanganate. Sodium permanganate has similar chemical properties to potassium permanganate, but a higher solubility in water, allowing less material to be used for neutralization.

Concentrations of rotenone used to eliminate fish can temporarily reduce populations of some species of aquatic invertebrates, causing changes in macroinvertebrate community composition. Certain species of aquatic invertebrates are more sensitive to rotenone than others, and some take longer to recover than others (Engstrom-Heg et al. 1978). Most of the sensitive species are in the insect orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). Also, a high mortality of Chironomids (insect order Diptera) was observed during rotenone treatments on the San Rafael restoration project (Jim Rorabaugh, FWS, pers. comm., 2009). The ability of aquatic invertebrates to survive a rotenone treatment depends on life history, oxygen requirements and habitat. In most cases, reduction of aquatic invertebrates was temporary with the majority of taxa recovering within 1-2 years (Binns 1967, Trumbo et al. 2000, UDWR 2002). Engstrom-Heg et al. (1978) reported long-term impacts of rotenone are mitigated because those insects that were most sensitive to rotenone also tended to have the highest rate of recolonization. Short life cycles (Anderson and Wallace 1984), good dispersal ability (Williams and Hynes 1976) and generally high reproductive potential (Anderson and Wallace 1984) give aquatic invertebrates the capability for rapid recovery from disturbance (Jacobi and Deegan 1977, Boulton et al. 1992, Matthaei et al. 1996). Because aquatic invertebrates will be salvaged from the creek before treatment and then returned, the populations are likely to expand more rapidly than if relying on downstream movement from the untreated reach. Further, the lack of fish in the creek for several months will reduce predation pressure on the populations, allowing them to rebound more quickly. A full description of the impacts expected from a chemical stream renovation can be found in the 2007 BA and BO (USBR 2007, FWS 2007), and the 2008 Redrock Canyon EA and BO (USBR 2008, FWS 2008).

Effects to proposed critical habitat in Bonita Creek from the piscicide application would be to PBF 2 (food base). Populations of aquatic invertebrates that provide the forage base for spikedace and loach minnow would be significantly reduced by the piscicide. Salvage and repatriation of aquatic invertebrates will allow quicker recolonization of the treatment reach, and fish are not to be repatriated for at least several months to a year which will allow time for the food base to recover. Completion of the proposed action will remove nonnative fish species from Bonita Creek, which allows PBF 5 to be met.

## **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, Tribal, or local private actions that are reasonably certain to occur in the action area. 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. Effects of past Federal and private actions are considered in the Environmental Baseline. No additional cumulative effects other than those considered in the 2007 BO (FWS 2007) are anticipated.

## CONCLUSION

After reviewing the current status of the spikedace, Gila chub, desert pupfish, loach minnow, and Gila topminnow, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the application of rotenone and other native fish management actions in lower Bonita Creek is not likely to jeopardize the continued existence of Gila chub, Gila topminnow, desert pupfish, spikedace, and loach minnow. Critical habitat for Gila chub has been designated but does not occur in the action area so would not be affected. Proposed critical habitat for spikedace and loach minnow would not be significantly affected by the proposed action, thus no destruction or adverse modification of critical habitat is anticipated.

We present these conclusions based on the following:

1. Although the proposed action will have short-term adverse effects to all five listed fish species, it will result in long-term benefits to these species by protecting all five from adverse effects of invasive nonnative aquatic species that prey on and compete with them, and by improving the overall suitability of Bonita Creek for future reestablishment efforts. Ultimately, these five species will be better off and closer to recovery with the project than without it.
2. All five species have had multiple populations of various sizes, some of which may not be self-sustaining yet, established in the last three years. These newly established populations improved the five fish species' status both in Bonita Creek and elsewhere in the range. Additional recovery actions are anticipated that can address future treatments in Bonita Creek (Table 1).
3. Populations of all five species will be unaffected in untreated reaches of Bonita Creek. These fish, along with the salvaged fish, can be expected to return the treated reaches to pre-treatment levels or increase populations over time.
4. PBF 2 of proposed critical habitat would be temporarily affected but would recover prior to fish being returned, and removal of nonnative fish allows PBF 5 to be met.

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 USBR and BLM so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM and USBR have a continuing duty to regulate the activity covered by this incidental take statement. If the USBR or BLM (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. To monitor the impact of incidental take, the USBR and BLM must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

### **AMOUNT OR EXTENT OF TAKE**

The FWS anticipates that the proposed action will result in incidental take of Gila topminnow, loach minnow, spikedace, Gila chub, and desert pupfish in addition to incidental take anticipated in the 2007 BO (FWS 2007). Incidental take will be difficult to detect for multiple reasons, including: dead animals are difficult to find, cause of death may be difficult to determine, and losses may be masked by seasonal fluctuations in numbers. The size of the existing native fish populations at the time of the 2010 and future treatments is unknown, and the proportion of the population salvaged before treatments will be difficult to ascertain. It is expected that the salvage operations will remove as many fish as can be captured and placed into holding facilities until returned to the creek, which minimizes the amount of incidental take due to the treatment. Therefore, we anticipate that the proposed action would likely result in up to 100% loss of individuals of all five species that are not salvaged. The incidental take is expected to be in the form of harm, harassment, kill, and pursuit from:

1. Management actions to remove nonnative aquatic species, including piscicide application and walking in the stream;
2. Removal of beaver dams;
3. Dewatering and fill of the pool behind the barrier.

The amount of incidental take authorized in this incidental take statement will be considered exceeded if salvage efforts included as part of the proposed action are not completed before the rotenone treatment of the creek.

## **EFFECT OF THE TAKE**

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the Gila chub, Gila topminnow, desert pupfish, loach minnow, or spikedace or to result in adverse modification of critical habitat for the reasons stated in the Conclusions section above.

## **REASONABLE AND PRUDENT MEASURES**

### **Gila chub, Desert pupfish, Loach minnow, Spikedace**

We believe that the following reasonable and prudent measures are necessary and appropriate to minimize take these four species:

1. Conduct all proposed actions in a manner that will minimize direct mortality.
2. Conduct all proposed actions in a manner that will minimize loss and alteration of habitat (including the aquatic faunal community).
3. Monitor the effects of the proposed action on the four species and their habitat to document levels of incidental take, and report the findings to the FWS.

### **Gila topminnow**

We believe that the following reasonable and prudent measures are necessary and appropriate to minimize take of Gila topminnow:

1. Conduct all proposed actions in a manner that will minimize loss and alteration of habitat (including the aquatic faunal community) of Gila topminnow.
2. Monitor the effects of the proposed action on Gila topminnow and their habitat to document levels of incidental take, and report the findings to the FWS.

## **TERMS AND CONDITIONS**

To be exempt from the prohibitions of section 9 of the Act, the BLM and USBR must comply with the terms and conditions of the reasonable and prudent measures above, and report implementation of these terms and conditions to us. These terms and conditions are non-discretionary. The reasonable and prudent measures, in conjunction with the implementing terms and conditions, are designed to minimize or avoid the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided.

### **Gila chub, Desert pupfish, Loach minnow, Spikedace**

The following term and condition will implement reasonable and prudent measure 1 for all four species:

1.1 To the extent practicable, all activities in the stream channel will be conducted outside the reproductive season. This includes piscicide application and beaver dam removal.

The following term and condition will implement reasonable and prudent measure 2 for all four species:

2.1 Minimize activity and disturbance in the stream during renovation and breaching of beaver ponds.

The following term and condition will implement reasonable and prudent measure 3 for all four species:

3.1 A written report shall be submitted by the BLM to the FWS annually documenting Bonita Creek activities that resulted in documented take during that year. The report will include a discussion of compliance with the above terms and conditions and will be due March 15 of the year after a treatment has occurred.

### **Gila topminnow**

The following term and condition will implement reasonable and prudent measure 1 for Gila topminnow:

1.1 Minimize activity and disturbance in the stream during renovation and breaching of beaver ponds.

The following term and condition will implement reasonable and prudent measure 2 for Gila topminnow:

2.1 A written report shall be submitted by the BLM to the FWS annually documenting Bonita Creek activities that resulted in documented take of Gila topminnow during that year. The report will include a discussion of compliance with the above terms and conditions and will be due March 15 of the year after a treatment has occurred.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The BLM and BR must immediately provide an explanation of the causes of the taking and review with the Arizona Ecological Service Office the need for possible modification of the reasonable and prudent measures.

## **Disposition of Dead or Injured Listed Species**

Upon locating a dead, injured, or sick listed species not the result of the rotenone treatment of Bonita Creek, 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. Because part of the action proposed is almost certain to cause the death or injury of listed species, especially Gila topminnow, the normal requirements of this section are waived for individuals of the five species killed or injured by the rotenone treatment. The annual reports required by the above terms and conditions will be forwarded to the FWS's Law Enforcement Office at the address given above.

## **CONSERVATION RECOMMENDATIONS**

No new conservation measures are presented.

## **REINITIATION NOTICE**

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

The FWS appreciates the efforts of the USBR and the BLM to identify and minimize effects to listed species from this project. We encourage you to coordinate the review of this document with AGFD. In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the San Carlos Apache Tribe since it may be affected by this project. By copy of this biological opinion, we notify the San Carlos Nation of the status of this project. For further information please contact Doug Duncan (520) 670-6150 (x236) or Lesley Fitzpatrick (602) 242-0210 (x236). Please refer to consultation number (22410-2007-F-0233R1) in future correspondence concerning this project.

/s/Jean Calhoun for

Steven L. Spangle

cc: Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ  
State Director, Bureau of Land Management, Phoenix, AZ (T. Hughes)  
Project Leader, Arizona Fisheries Resource Office, Pinetop, AZ  
Area Manager, Bureau of Indian Affairs, Phoenix, AZ

Tribal Chairman, San Carlos Apache Tribe, San Carlos, AZ  
Director, San Carlos Apache Tribe, Recreation & Wildlife, San Carlos, AZ  
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

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Table 1. Stocking records in Arizona and New Mexico for spikedace, loach minnow, desert pupfish, Gila topminnow, and Gila chub after the completion of the 2007 Bonita Creek biological opinion.		
Water name	Date	Taxa
Bonita Creek	10/15/2008	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
	10/31/2008	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	10/22/2009	<i>Meda fulgida</i>
	11/10/2010	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
11/15/2010	<i>Meda fulgida</i>	
	<i>Tiaroga cobitis</i>	
Burro Cienega, New Mexico	11/5/2007	<i>Poeciliopsis occidentalis</i>
	6/12/2008	
Chalky Spring	7/1/2009	<i>Poeciliopsis occidentalis</i>
	10/7/2009	
Cherry Spring Canyon	10/4/2007	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	9/17/2008	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
Cottonwood Spring (Goldfield)	8/29/2008	<i>Poeciliopsis occidentalis</i>
Fossil Creek	11/2/2007	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
	11/29/2007	<i>Poeciliopsis occidentalis</i>
	3/7/2008	<i>Tiaroga cobitis</i>
	5/21/2008	
	11/24/2008	<i>Meda fulgida</i>
		<i>Poeciliopsis occidentalis</i>
		<i>Tiaroga cobitis</i>
	7/2/2009	<i>Poeciliopsis occidentalis</i>
10/22/2009		
11/6/2009		
Fresno Canyon	4/1/2008	<i>Poeciliopsis occidentalis</i>
Headquarters Spring	9/17/2008	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	10/28/2009	<i>Cyprinodon macularius</i>
	10/29/2010	<i>Cyprinodon macularius</i>

Hot Springs Canyon	10/4/2007	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
	9/17/2008	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
	10/28/2009	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
Howard Well	7/1/2008	<i>Cyprinodon macularius</i>
	10/19/2009	
International Wildlife Museum	9/11/2009	<i>Gila intermedia</i>
Morgan City Wash	6/30/2009	<i>Cyprinodon macularius</i>
	7/1/2009	<i>Poeciliopsis occidentalis</i>
	10/7/2009	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	9/9/2010	<i>Cyprinodon macularius</i>
Mud Spring (#18)	6/12/2008	<i>Cyprinodon macularius</i>
	7/15/2008	
	7/17/2008	<i>Poeciliopsis occidentalis</i>
	8/26/2009	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	10/15/2009	<i>Cyprinodon macularius</i>
Pemberton Pond	3/13/2009	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	7/9/2009	<i>Poeciliopsis occidentalis</i>
	10/15/2009	<i>Cyprinodon macularius</i>
Redfield Canyon	10/4/2007	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
	9/17/2008	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
	10/29/2010	<i>Meda fulgida</i>
		<i>Tiaroga cobitis</i>
Robbins Butte – multiple sites	11/17/2009	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	4/27/2010	
	8/5/2010	<i>Cyprinodon macularius</i>
	8/12/2010	
	8/26/2010	
9/9/2010		
San Francisco River, New Mexico	2008	<i>Meda fulgida</i>
Secret Spring	10/4/2007	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	10/29/2010	<i>Cyprinodon macularius</i>

Spur Cross Solar Oasis	3/25/2009	<i>Poeciliopsis occidentalis</i>
	4/30/2009	
	11/18/2009	<i>Cyprinodon macularius</i>
Swamp Springs Canyon	10/4/2007	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	9/17/2008	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
Swimming Pool Tank (Robbins Butte WMA)	11/17/2009	<i>Poeciliopsis occidentalis</i>
TNC Lower San Pedro River Preserve East Pond	4/3/2009	<i>Cyprinodon macularius</i>
		<i>Poeciliopsis occidentalis</i>
	10/8/2009	<i>Cyprinodon macularius</i>
	3/16/2009	<i>Poeciliopsis occidentalis</i>
Tule Creek	9/19/2007	<i>Cyprinodon macularius</i>
	10/14/2009	
Twin Tanks (Robbins Butte WMA)	11/17/2009	<i>Cyprinodon macularius</i>
Walnut Spring (#20)	7/25/2008	<i>Cyprinodon macularius</i>
Willow Spring (White Tank Regional Park)	3/24/2009	<i>Poeciliopsis occidentalis</i>
	5/1/2009	

## APPENDIX A – CONCURRENCE

### Southwestern willow flycatcher

We concur with your determination that the proposed action may affect, but is not likely to adversely affect, the southwestern willow flycatcher (SWWF). We base this concurrence on the following:

- 1) SWWF surveys were conducted by USBR on Bonita Creek from 2004 through 2007. None were ever detected along lower Bonita Creek, and the closest record was a single nesting SWWF located three miles south of the project area in 2003. All other records were along the Gila River approximately 20 to 25 miles southwest of the project area.
- 2) During USBR's survey period, habitat suitability for SWWF on Bonita Creek declined each year. By the time the last survey (2007) was conducted, the vegetation had thinned due to increased beaver activity. As a result, habitat suitability for SWWF is considered marginal.
- 3) Renovation activities are expected to occur in June when the stream flows are at their lowest. Although it is unlikely that a SWWF would be present on Bonita Creek based on past survey results, USBR proposes that:
  - (1) They will conduct one SWWF survey during the first survey period (15-31 May, 2010). During the survey, habitat suitability for SWWF will be evaluated. If habitat conditions appear similar to those in the last (2007) survey, USBR will place a memorandum to the file indicating that habitat suitability is marginal and based on the previous survey records it is unlikely that SWWF is present in the project area. USBR will conclude the proposed project will have no affect on SWWF.
  - (2) If the May survey concludes habitat conditions for SWWF have improved since 2007, USBR will conduct a second survey after the June 15 migrant cut-off date and before renovation activities. If no SWWF are observed during the second survey, BR will document the findings in a memorandum to the file concluding that the proposed action will have no affect on SWWF.
  - (3) If a SWWF is observed during the second survey, USBR will document the location. This information will be provided to the personnel conducting the renovation activities. Salvage and renovation personnel will be required to minimize their activities near the SWWF territory. USBR will conclude that the proposed project may affect, but will not likely adversely affect, SWWF and will request an expedited concurrence, so that the renovation project can proceed before onset of the monsoon season. USBR will conduct a third SWWF survey after the renovation is completed. Results of the surveys will be sent to FWS.