

**United States Department of the Interior  
U.S. Fish and Wildlife Service  
2321 West Royal Palm Road, Suite 103  
Phoenix, Arizona 85021  
Telephone: (602) 242-0210 FAX: (602) 242-2513**

AESO/SE  
2-21-02-F-0299

October 4, 2002

Memorandum

To: Assistant Field Supervisor, Las Vegas Field Office, Fish and Wildlife Service,  
Las Vegas, Nevada

From: Acting Field Supervisor

Subject: Tilapia Removal Program on the Virgin River, Clark County, Nevada and Mohave  
County, Arizona

Thank you for your request for intra-Service consultation with the Arizona Ecological Services Office (AESO) of the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request for formal consultation was dated August 28, 2002, and received by us on August 28, 2002. At issue are impacts that may result from the proposed program on the Virgin River in Clark County, Nevada and Mohave County, Arizona. The species of concern are the endangered woundfin (*Plagopterus argentissimus*), Virgin River chub (*Gila seminuda*), Yuma clapper rail (*Rallus longirostris yumanensis*) and southwestern willow flycatcher (*Empidonax traillii extimus*) and designated critical habitat in the Virgin River for the woundfin and Virgin River chub. The yellow-billed cuckoo (*Coccyzus americanus*), a candidate for Federal listing, is also found in the vicinity of the proposed action.

In your memorandum, you requested our concurrence that the proposed action was not likely to adversely affect the Yuma clapper rail, southwestern willow flycatcher and yellow-billed cuckoo. We concur with this finding. Justification for this concurrence is found in Appendix A to this biological opinion.

This biological opinion responds to your request and it is based on information provided in the July 2002 draft environmental assessment (DEA)(USFWS 2002a), the August 28, 2002, biological evaluation (USFWS 2002b), past consultations that have addressed the use of rotenone as a management tool in the Virgin River, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, use of rotenone in fisheries management and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

## Consultation History

November 2001 to June 2002: several meetings and conference calls with the FWS Las Vegas Field Office (LVFO) and AESO, Arizona Game and Fish Department, Nevada Division of Wildlife, and BioWest Inc. were held to discuss the finding of blue tilapia, what this invasion would mean to the native fishes of the Virgin River, and possible treatment options.

The biological evaluation was received August 28, 2002.

The draft biological opinion was provided to the LVFO on September 12, 2002. Comments on the draft were received by AESO on September 27, 2002.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

The proposed action is a five-year plan to conduct blue tilapia (*Oreochromis aurea*) eradications in the reach of the Virgin River beginning at the Mesquite Irrigation Diversion in Mohave County, Arizona and continuing approximately 6 miles downstream to the Nevada State Highway 170 bridge in Clark County, Nevada (Figure 1). The reach includes the Bunkerville Diversion, located upstream of the NV170 bridge over the river. The eradication would be conducted using the fish toxicant rotenone. The intent of the project is to prevent the establishment of blue tilapia in this reach of the Virgin River and prevent their migration to the Littlefield and Virgin River Gorge reaches of the river above the Mesquite Diversion in Arizona and subsequently into the Virgin River in Utah. The proposed action also includes the modification of the existing canal system at the Mesquite and Bunkerville diversions to provide effective physical barriers to upstream fish migration. Details of the proposed modifications were not provided in the DEA. The following information is summarized from the DEA (USFWS 2002a) and biological evaluation (USFWS 2002b).

#### Need for the Proposed Action

The blue tilapia is a species native to northern Africa and the Middle East that has been widely introduced (legally and illegally) into the United States for aquaculture and other purposes. Tilapia were first discovered in the Muddy River in southern Nevada in 1992, the result of an illegal introduction. Tilapia were found in the Virgin and Temple Bar basins of Lake Mead, and are now found throughout the lake. By 1996, tilapia had spread throughout most of the Muddy River and drastic declines in native fish populations were positively correlated with the spread of the tilapia in the system. Although the literature describes tilapia as being planktivorous or herbivorous (Trewavas 1983), stomach samples taken from tilapia in native fish habitats of the Muddy River showed significant amounts of predation on native fish. Eradication efforts for tilapia in the Muddy River were initiated in the late 1990's. Given the knowledge of effects to native fish in the Muddy River from the expansion of tilapia, State and Federal managers, the local water district, and concerned citizens in Nevada and Arizona do not wish to allow the

tilapia access to the Virgin River above the Mesquite Diversion to protect woundfin and Virgin River chub populations in Arizona and Nevada. Non-native fish populations already in the river have a significant adverse impact on native species, including the woundfin and Virgin River chub, and the addition of another predaceous fish species to the system would increase the risks to survival of these endangered species and compromise recovery efforts throughout the river.

Tilapia were first documented from the Virgin River on July 26, 2001, when 18 young of the year tilapia were captured from the river below the Bunkerville Diversion. The fish are likely to have come up into the Virgin River from Lake Mead. In November 2001, one tilapia was found above the Bunkerville Diversion. None have been captured in the Mesquite to Bunkerville reach since then; however, flow conditions have not been conducive to capturing fish. While several fish were observed after November 2001 that were suspected to be tilapia, no tilapia were documented in the Virgin River until September 23-25, 2002, when 5 young of the year tilapia were found at Halfway Wash and another 2 were found below the Bunkerville Diversion.

#### The Proposed Action

The proposed action would provide for one or more rotenone treatments of the Virgin River between Mesquite Diversion and the NV170 bridge over the next 5 years (2002-2007). Depending on future surveys for tilapia, the treatments may include the entire area, part of the area, or localized spot treatments (spot treatments include short stretches of river, individual pools or other areas of limited extent). The extent and number of treatments to be conducted under the proposed action is not known. The Lower Virgin River Recovery Implementation Team will make decisions to implement treatment under the 5-year program based on survey data on the presence of tilapia within the reach, success of the initial treatment, and other factors as applicable. Rotenone is the toxicant of choice because it has been widely used for fish eradication throughout the United States and other parts of the world and is effective in the water quality conditions present in the Virgin River. Rotenone is a plant-derived chemical with no known adverse effects to reptiles, birds, mammals or humans from the application concentrations or residues. Rotenone naturally breaks down in the environment or can be de-toxified at the lower end of the treated reach using potassium permanganate. Rotenone has been used extensively in the upper reaches of the Virgin River in Utah to remove red shiners and other non-native fish species from habitat of the woundfin and Virgin River chub (Table 1). Rotenone treatments in the Virgin River in Utah initiated since 1996 are conducted under an existing section 7 consultation.

The proposed action includes pre-treatment surveys for fish species in the river that would involve capture and removal of as many as possible of the native fishes from the reach. Captured fish would be released upstream of the Mesquite Diversion. During the treatment, crews will be on site as safety and logistics allow to collect any native fish found alive and remove them to safety. These crews will also collect and preserve native fish mortalities, as well as collect and

dispose of large-bodied non-native fish mortalities and any concentrations of smaller fish mortalities as feasible. Monitoring and surveys to look for tilapia below and between the diversion dams over the five-year period covered by the program is also part of the proposed action.

The proposed action also requires the existing Bunkerville Diversion to be improved to create an effective barrier to tilapia moving upstream from Lake Mead. The existing diversion dam does not prevent fish from passing upstream under a variety of conditions. The existing Mesquite Diversion has also been evaluated as a barrier and, if needed, modifications will also be made to that structure. The Bureau of Reclamation is developing plans for the structural modifications needed at the dams. These plans are not complete, and funding has not been obtained to implement the modifications at this time.

## **STATUS OF THE SPECIES (RANGE-WIDE)**

### Species/critical habitat description

#### *Woundfin*

The woundfin was listed as endangered on October 13, 1970 (35 FR 16047). Subsequent to listing, critical habitat was originally proposed on November 2, 1977 (42 FR 57329). The proposal was withdrawn under the 1978 amendments to the Act requiring that all proposals pending for more than two years be withdrawn (45 FR 64853). A new critical habitat proposal was published on April 5, 1995 (60 FR 17296) with a final rule published on January 26, 2000 (65 FR 4140). The Woundfin Recovery Plan was originally approved in 1979 and subsequently updated in 1994. This plan was superseded by the Virgin River Fishes Recovery Plan (USFWS 1995) in 1995.

Critical habitat for the woundfin includes the Virgin River and its 100-year floodplain from the Virgin River confluence with La Verkin Creek in Utah to Halfway Wash in Nevada.

#### *Virgin River chub*

The Virgin River chub was proposed for listing as endangered, with critical habitat, on August 23, 1978 (43 FR 37668). This proposal was withdrawn on September 30, 1980 in accordance with the 1978 amendments to the Act requiring proposals pending for more than two years be withdrawn (45 FR 64853). A new proposal for listing as endangered, with critical habitat, was published on June 24, 1986 (51 FR 22949). The Virgin River chub was listed as endangered on August 24, 1989 (54 FR 35305). This listing covered only the Virgin River, the known range of the chub, then considered a subspecies of roundtail chub (*Gila robusta seminuda*). On July 24, 1995, based on new taxonomic information, the FWS proposed changing the species from a subspecies to a full species (*Gila seminuda*). Critical habitat for the Virgin River chub was proposed with that for the woundfin in 1995 and a final rule was published in 2000. The Virgin River Fishes Recovery Plan (USFWS 1995) is the recovery plan for the Virgin River chub.

Critical habitat for the Virgin River chub includes the Virgin River and its 100-year floodplain from the Virgin River confluence with La Verkin Creek in Utah to Halfway Wash in Nevada.

### Life History

Life history information for the woundfin and Virgin River chub is provided in the 1995 Recovery Plan (USFWS 1995). This document is incorporated by reference.

### Species Status and Distribution

#### *Woundfin*

Woundfin historically were found from Pah Tempe Springs on the mainstem of the Virgin River and the lower portion of La Verkin Creek in Utah, downstream to Lake Mead in Nevada. Woundfin have experienced continuing significant population declines in both occupied range and abundance. An examination of long-term sampling data from stations in Utah, Arizona and Nevada documented declines between 1976 and 1993 (Holden and Zucker 1996). Sampling efforts since 1994 continue to show this decline (Virgin River Fishes Recovery Team, unpublished data). These declines have been linked to the spread of red shiners (*Notropis lutrensis*) into and up the Virgin River from the Lake Mead area in the 1970's through today (USFWS 1995, Holden et al. 2001).

In Utah, significant efforts to restore the woundfin population are ongoing. The recently approved Virgin River Resource Management and Recovery Program provides funding for research and management activities to recover the woundfin in Utah. These activities include provision for minimum flows, creation of fish barriers and rotenone poisoning projects to eliminate non-native fish species, especially the red shiner, from woundfin habitats. Unfortunately, red shiner were found in previously treated habitats in 2002, raising questions about short and long-term additional management needs. In Arizona and Nevada, ongoing work stocking hatchery produced young woundfin in the Mesquite to Bunkerville reach is combined with mechanical removal of red shiner in researching this as a management option.

#### *Virgin River Chub*

The Virgin River chub occurs in the mainstem Virgin River from Pah Tempe Springs in Utah to at least the Arizona-Nevada border. Historically, Virgin River chub were found in the lower Virgin River in Nevada down as far as the confluence with the Colorado River, but few have been found recently. Considered an abundant species in the early 1900's, Virgin River chub are now uncommon to rare throughout the occupied range. Most recent records are from the reach of the Virgin River in Arizona. Sampling data for the Virgin River chub is not as definitive as for the woundfin, in part because the methodology used is not the most effective for this species. Declines in species population are attributed to dewatering and subsequent habitat changes in the Virgin River, and non-native fish introductions.

The Muddy River population of the Virgin River chub is not currently protected under the Act. At the time of listing, the Muddy River chub was considered a separate subspecies of roundtail chub from the Virgin River chub. More recent taxonomic information supports the Muddy River chub as a distinct population of *Gila seminuda*. A status review for the Muddy River chub population was initiated in 1995.

The Virgin River Resource Management and Recovery Program in Utah includes funding for management and conservation of the Virgin River Chub. Arizona and Nevada have been working on development of a focused sampling protocol for the chub to improve data collected from the spring and fall survey efforts.

#### Analysis of the species/critical habitat likely to be affected

The proposed action would take place in occupied habitats for the woundfin and Virgin River chub which is within designated critical habitat for both species.

### **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.

#### Description of the action area

The action area is located within the Virgin Valley in Clark County, Nevada and Mohave County, Arizona. The Virgin Valley is formed by the Virgin River and separates Mormon Mesa from the Virgin Mountains. The river flows west to southwest through the City of Mesquite and then turns south and flows into the Overton Arm of Lake Mead. More extensive information on the action area is available in the DEA for the project (USFWS 2002a).

The hydrologic profile of the Virgin River is similar to that of most southwestern desert riparian areas. Flows are highly variable, with daily and seasonal fluctuations in temperature, flow, and physical and chemical parameters (Deacon et al. 1987). Water in the Virgin River exhibits high salinity and turbidity. High flows during spring runoff are common in the months of April and May, with extreme low flows during the dry summer months, which are typically July and August. Flash floods can result from torrential monsoon rains that occur later in the summer, and peak annual flows are more common in August and September than in any other month.

Following flash floods, the Virgin River frequently forms new channels within the wider parts of the flood plain, resulting in braiding and disconnected oxbows. Aquatic vegetation within the channels is limited by variable flow conditions and unstable substrates.

The absence of major dams on the main stem of the Virgin River allows relatively natural flooding events to occur within the flood plain during peak flows. Quail Creek Dam and Sand Hollow Dam are off the mainstem; however, water is diverted to them from the mainstem and there are effects on both flood and base flows from these diversions. Several other diversions exist on the river and may function similar to dams at lower flows in that water is ponded behind the diversion structures and channel morphology directly downstream of the structures is altered. These diversions have also depleted average stream flows in the Virgin River. Most of the Virgin River streambed has not been channelized, which allows the river to frequently change stream channel course within the flood plain and form braided channels, oxbows, and backwaters that help promote formation of riparian and wetland vegetation.

#### Status of the species within the action area

Woundfin numbers in the lower Virgin River fluctuate greatly, depending on stocking rates and environmental conditions. Woundfin numbers between the Bunkerville and Mesquite diversions in June of 2000 were estimated to be 625 adults, with a standard error of 97. In addition, a total of 242 young-of-the-year were captured. These numbers were influenced by the stocking of 11,200 woundfin in 1999 and 4,500 woundfin in 2000 within the Nevada portion of the reach (Holden and Golden 2000, Nevada Division of Wildlife 2001). Up to 50 woundfin were also captured in a five-mile stretch below the Riverside bridge during four sampling trips between May and August of 2000 (Holden and Golden 2000). No stocking of woundfin has occurred since 2000, and river flow (all seasons) and clarity have not been favorable. These factors contributed to fewer numbers of woundfin in the lower Virgin River in 2001. The greatest number of woundfin captured during standardized sampling in 2001 were 146 individuals during March. Surveys between July of 2001 and May 2002 resulted in between 0 and 15 woundfin, with numbers typically being below 5 individuals (Golden and Holden, 2001; Mike Golden, personal communication).

Virgin River chub has experienced a general decline in Utah, Arizona, and Nevada, particularly since the mid-1980s. Hardy and Addley (1994) noted that declines may be due to droughts and other natural climatic changes. Natural droughts may be exacerbated by water development, including diversions, and increasing domestic use of water. More recent data are being analyzed to determine the current status of Virgin River chub and to determine if declining trends continued through the late 1990s. Current sampling methods for chub are inadequate for estimating population numbers in the Virgin River because chub are uncommon, and generally occur in deep pools associated with runs. However, seining efforts for woundfin in 2000 and 2001 between the Mesquite and Bunkerville diversions in Arizona and Nevada resulted in capture of 22 individual chubs (USFWS 2002a). Surveys in 2002 have captured 361 chub in the river above the action area (USFWS unpublished data). Of these 361 fish, 358 were captured in the vicinity of Beaver Dam Wash and the remaining 3 were captured above Mesquite Diversion.

### Factors affecting species environment within the action area

Both species have declined in numbers largely due to the introduction and proliferation of nonnative fishes such as red shiner and loss or degradation of habitat. The introduction and proliferation of red shiner into the aquatic ecosystem has contributed significantly to the species' decline because it competes with the native fishes for food resources and space, and may be a predator of the larval and young-of-the-year life stages (Addley and Hardy 1993), thereby reducing survival and recruitment of native fishes. Activities that have contributed to loss or degradation of habitat include channelization of water courses, water impoundments, and water diversion projects, which have resulted in loss and alteration of water flow, and alterations in temperature and sediment processes. Data indicate that in upstream reaches of the Virgin River, woundfin are not able to recover quickly after disturbances; therefore, subtle changes in the river resulting from water development may have greater impacts than anticipated (Holden et al. 2001). Both fish species are vulnerable to further declines from the ongoing and planned urban and water development projects to meet the needs of a rapidly growing human population in the Virgin Valley.

The recently issued biological opinion on a proposed sale of public lands in Clark County, Nevada (USFWS 2002c) summarized past section 7 activities within the general project area. This information is incorporated by reference.

### **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.

#### Direct and Indirect Effects

Application of rotenone to the treatment area would result in the death of fish and other vulnerable species (tadpoles, gilled invertebrates) that come into contact with the toxicant. Effects would not be felt downstream of the treatment area, since the rotenone would be detoxified at the NV170 bridge, downstream of Bunkerville Diversion. Effects to woundfin and Virgin River chub in the treatment area would be reduced for individual fish by an extensive salvage effort prior to the treatment that would lower the populations present in the river. Other native fish would also be removed from the river when captured. Salvage operations during the treatment could also remove additional individuals and reduce the level of mortality. The most recent information on the numbers of woundfin and chub in the treatment area indicates that populations are very low for woundfin. For chub, it is more difficult to assess, since the survey methods are not directed to efficiently capture this species. However, recent survey information

indicates that the chub population in the reach is not large, since smaller juveniles and sub-adults are captured elsewhere in the river using the same sampling techniques.

Effects to critical habitat will be transitory. Water quality within the treatment reach and immediately below will be affected by the application of rotenone and potassium permanganate (the de-toxifying agent), but these effects will not persist over 2 hours past the final addition of rotenone. Invertebrate populations in the treatment reach will be depressed following treatment; however re-colonization of the reach from above Mesquite Diversion should be rapid and no long-term effects are likely to occur.

#### Interrelated and Interdependent Effects

No interrelated or interdependent effects have been identified for the proposed action.

### **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.

The Virgin River valley in Arizona and Nevada is likely to experience additional urbanization over the near future. Change in use of existing water supplies, both surface and groundwater, from agricultural uses to municipal uses may result. Additional groundwater use may also be the result of increasing populations.

### **CONCLUSION**

After reviewing the status of the woundfin and Virgin River chub, the environmental baseline for the action area, the effects of the proposed rotenone program over the five-year period, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the woundfin and Virgin River chub, and is not likely to destroy or adversely modify designated critical habitat. 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.

This finding is based on the following factors:

The existing populations of woundfin and Virgin River chub in the action area are small and the amount of mortality likely to occur will not have a significant effect on the survival and recovery of the species. The salvage efforts included in the proposed action further reduce the amount of mortality.

Elimination of tilapia from the action area will provide significant protection for woundfin and Virgin River chub populations upstream of the action area, thus preventing additional

adverse effects from tilapia predation and competition that could reduce survival and recovery opportunities for the listed fish.

Effects to critical habitat are minor and will have no long-term adverse effects on the ability of the habitat to support the listed fish.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4 (d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the FWS 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 by the FWS 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 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 LVFO 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 LVFO has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the LVFO (1) fails to assume and implement the terms and conditions or (2) fails 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, the LVFO must report the progress of the action and its impact on the species to the AESO as specified in the Incidental Take Statement [50 CFR§402.14(i)(3)].

#### Amount or extent of the take

The FWS anticipates that 50 woundfin and 50 Virgin River chubs will be taken as a result of this proposed action over the five-year period. This take was determined using data on existing population levels and multiple treatments being implemented. The incidental take is expected to be in the form of direct or indirect mortality of individual fish in the treatment area. Fish salvaged from the treatment area prior to the application of rotenone may also be at risk of mortality from handling during removal and return actions, or conditions in the holding facilities.

### Effect of the take

In the accompanying biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the woundfin or Virgin River chub or destruction or adverse modification of critical habitat.

### **REASONABLE AND PRUDENT MEASURES/TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, the LVFO must comply with the following terms and conditions, which implement the reasonable and prudent measures and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The proposed action contains significant measures to reduce the extent of the take and no additional measures to reduce take are provided in this incidental take statement. The following reasonable and prudent measures and implementing terms and conditions are necessary and appropriate to minimize the take of woundfin and Virgin River chub:

Reasonable and prudent measure 1:

The LVFO will document the numbers of woundfin, Virgin River chub, and other native fish affected by the proposed actions. Terms and conditions to implement this measure are as follows:

A report listing the number of listed fish caught, released alive, and died as a result of handling or rotenone toxicity will be provided to this office within 30-days of completion of any rotenone treatment implemented under this project.

The report detailed above will also contain information on the number of tilapia caught or killed as part of the rotenone treatment.

### 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 LVFO must immediately provide an explanation of the causes of the taking and review with the AESO 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 initial notification must be made to the FWS Law Enforcement Office in Nevada at (702) 388-6380 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 will 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.

We recommend that:

The report on number of tilapia killed as a result of the treatment also include information on other non-native fishes killed during the treatment. This information will assist in future projects as well as documenting suitability of the area for non-native species.

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

### **REINITIATION NOTICE**

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR§402.16, reinitiation of formal consultation is required where discretionary Federal 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 habitats 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 the LVFO's efforts to identify and minimize effects to listed species from this

project. For further information, please contact Lesley Fitzpatrick (x236) or Tom Gatz (x240). Please refer to the consultation number 2-21-02-F-299, in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
Director, Fish and Wildlife Service, Arlington, VA  
Field Supervisor, Fish and Wildlife Service, Salt Lake City, UT

John Kennedy, Arizona Game and Fish Department, Phoenix, AZ  
Director, Nevada Department of Wildlife, Reno, NV

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\_\_\_\_\_. 2002b. Tilapia Removal Program on the Virgin River, Clark County, Nevada and Mohave County, Arizona. Biological Evaluation prepared for USFWS Arizona Ecological Services Field Office. Southern Nevada Field Office, Las Vegas, Nevada. 14pp.

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\_\_\_\_\_. 2002c. Sale of 10,620 acres of public lands in Clark County, Nevada, under the Mesquite Lands Act of 1986 as amended in 1996 and 1999. July 2002 Biological opinion issued to Bureau of Land Management (consultation number 1-5-02-F-495). Southern Nevada Field Office, Las Vegas, Nevada.

### TABLES AND FIGURES

Figure 1: General Vicinity Map for the Proposed Action

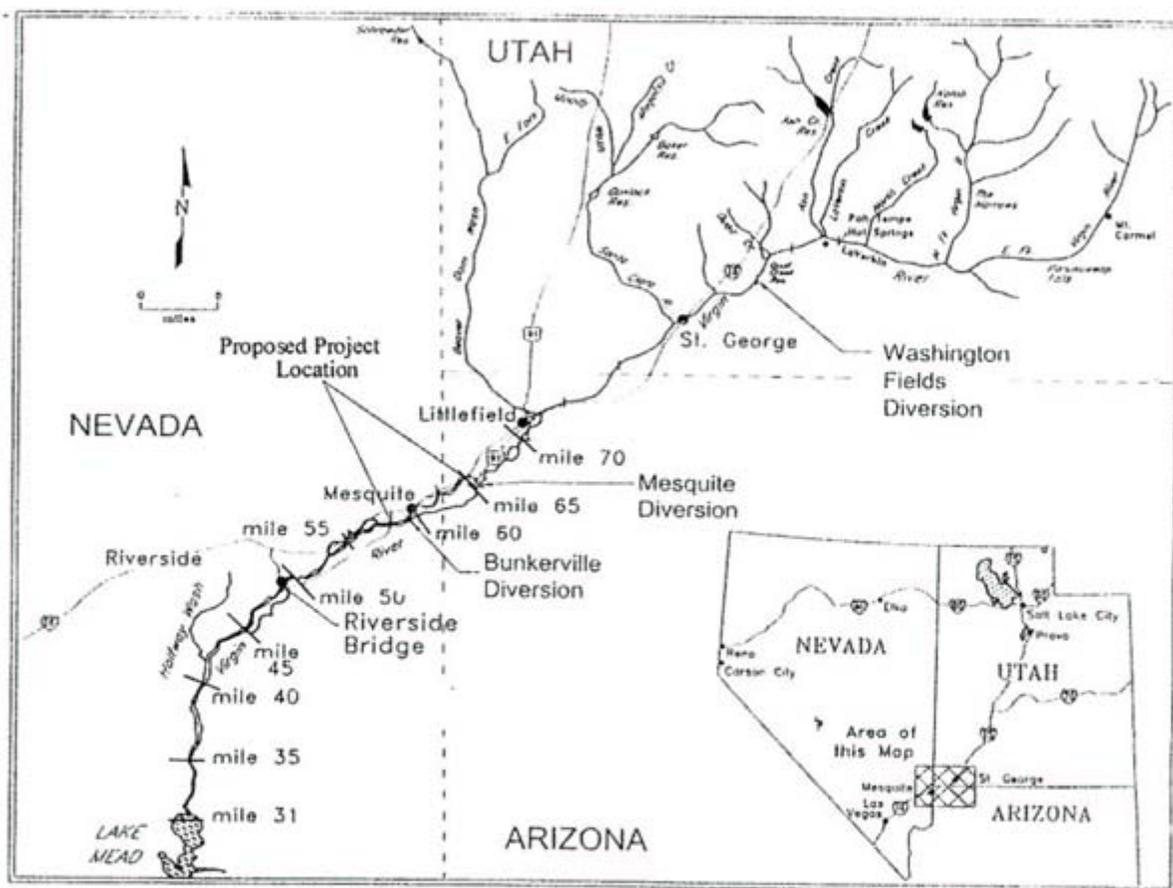


Table 1: Past rotenone treatments in the Virgin River, Utah, Arizona, and Nevada

## UTAH

1988 October:	Washington Diversion to UT/AZ border
1988 November:	Washington Diversion to UT/AZ border
1989 August:	Washington Diversion to UT/AZ border
1991 unknown:	Washington Diversion to Johnson Diversion
1996 March:	Washington Diversion to Johnson Diversion
1996 August:	Washington Diversion to Johnson Diversion
1996 December:	Washington Diversion to Johnson Diversion
1997 January:	Ft. Pierce Wash
1999 October:	Washington Fields to Johnson Diversion
1999 December:	Washington Fields drains and canals (Y Drain)
2000 December:	Washington Diversion to Johnson Diversion
2001 September:	Washington Fields drains and canals
2001 October:	Washington Diversion to Johnson Diversion
2001 November:	Washington Fields drains and canals (Y Drain and Middle Drain)

## ARIZONA

1988 October: toxicant from Utah treatment unintentionally reached Arizona

## NEVADA

1988 October: toxicant from Utah treatment unintentionally reached Nevada

## Appendix A: Concurrences

### *Southwestern willow flycatcher*

Southwestern willow flycatchers are present as both migrants and breeding birds in the Nevada portion of the Virgin River and surveys have detected this species near the action area at the Mesquite Study areas (downstream of the NV170 bridge) in 2000 and 2001 (McKernan and Braden 2002). No flycatchers are known from the action area itself.

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

No suitable breeding or migration habitat of the flycatcher would be physically disturbed by the proposed action.

Work as proposed would take place outside of the flycatcher migration and breeding season. Losses to aquatic insect production in the treated area should be of short-duration and no effects should be present by the time flycatchers return in the spring.

### *Yuma clapper rail*

Yuma clapper rails are present in the Nevada portion of the Virgin River. This is a non-migratory species, so individuals are present year round. Up to 4 rails were recorded near Beaver Dam Wash (upstream of the project area) in 2000 (McKernan and Braden 2001). Two other individuals were recorded near the NV170 bridge within the action area.

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

Although marsh areas in the action area would be treated with rotenone, the chemical is not toxic to rails and has limited toxicity to their primary food source (crayfish). Physical habitat in the marsh would not be eliminated by the treatments.

Rails would be temporarily disturbed or displaced by the crews during the treatments, but this would be of short duration and not likely to result in abandonment of the habitat. The treatments would not take place during the breeding season for the rail, and is also out of the normal molting period when adults are flightless.

### *Yellow-billed cuckoo*

Yellow-billed cuckoos have been observed at the lower end of the treatment site near the NV170 bridge. Cuckoo use dense riparian vegetation for nesting, and primarily feed on insects gleaned from foliage that are not aquatic in origin.

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

No suitable breeding or migration habitat of the cuckoo would be physically disturbed by the proposed action.

Work as proposed would take place outside of the cuckoo migration and breeding season.

There would not be any effects to the primary insect prey base for the cuckoo from the proposed action.