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AESO/SE
02-21-04-F-0036 January 30, 2004

Memorandum

To: Project Leader, Arizona Fishery Resources Office, Fish and Wildlife Service, Pinetop, Arizona

From: Field Supervisor

Subject: Pesticide Use Proposal for Lower Colorado River Fish and Wildlife Service Refuges in FY 04.

Thank you for your request for formal consultation with the Arizona Ecological Services Office (AESO) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated November 25, 2003, and received by us on December 3, 2003. At issue are impacts that may result from use of the fish toxicant rotenone at selected sites on the Havasu, Bill Williams River, Cibola, and Imperial national wildlife refuges (Refuges) on the lower Colorado River in La Paz, Mohave, and Yuma counties, Arizona and San Bernardino and Imperial counties, California. The proposed action may affect the endangered bonytail chub (*Gila elegans*) and razorback sucker (*Xyrauchen texanus*) and their designated critical habitat on the lower Colorado River.

In your intra-Service section 7 evaluation form, you requested concurrence with findings of "no effect"for the endangered brown pelican (*Pelecanus occidentalis*), southwestern willow flycatcher (*Empidonax traillii extimus*), and Yuma clapper rail (*Rallus longirostris yumanensis*); the threatened bald eagle (*Haliaeetus leucocephalus*); and the yellow-billed cuckoo (*Coccyzus americanus*), a candidate for listing under the Act. We concur with these findings of no effect for the bald eagle, brown pelican and yellow-billed cuckoo. We are unable to concur with your finding of "no effect" for the southwestern willow flycatcher and the Yuma clapper rail. However, based on the information provided, we are able to concur with a finding of "may affect, not likely to adversely affect" for those species. The explanations for our concurrences are given in Appendix A to this biological opinion.

This biological opinion is based on information provided in the November 18, 2003 intra-Service section 7 evaluation form, 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, the use of rotenone 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

- AESO staff discussed the development of the intra-Service evaluation form with Arizona Fishery Resources Office (AzFRO) staff from the Parker Office and Environmental Contaminants staff from the Fish and Wildlife Service (FWS) Regional Office during June and July of 2003.

- The intra-Service evaluation form was dated November 18, 2003 and signed by the AzFRO Project Leader on November 25, 2003. AESO received the request for consultation on December 3, 2003.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is defined by the Pesticide Use Proposal filed by Arizona Fishery Resources Office (AzFRO) with the FWS Regional Office to renovate isolated backwaters on the Refuges by removing all non-native fish species prior to the backwaters being stocked with bonytail chub and razorback sucker. The renovations to remove the non-native fish are required in order to remove predator and competitor non-native fish species that have adverse effects on the bonytail chub and razorback sucker and would interfere with the function of the backwaters as protected habitats for the two listed fish species. Establishment of these protected habitats is sponsored by the Bureau of Reclamation under terms of the 1997 biological and conference opinion on their operations and maintenance of the lower Colorado River (USFWS 1997). Where these protected habitats are being established on lands of the Refuges, the FWS, through the specific Refuge and AzFRO, is a cooperator in planning, preparing, and implementing the actions needed to establish the habitats.

The action area for the proposed action is defined as the four Refuges on which project backwaters would be located. Because of the very specific nature of this proposed action, all effects of the action are contained in the immediate vicinity of the backwaters selected for treatment with rotenone. Before any site is treated, a written work plan for the particular site would be developed as required by the Pesticide Use Proposal. Rotenone would be transported to the backwater in the manufacturers' containers and introduced into the backwater using dispersal tanks on boats, hand-held sprayers, or aerial application via helicopter. Empty containers would be rinsed, punctured and disposed of in a landfill. Equipment used on site would also be cleaned to prevent contamination of off-site areas. All personnel involved in the treatment would receive safety briefings prior to the treatment.

The number of specific sites to be renovated in FY04 have not been determined and will be dependent on progress made in planning for implementation of the protected habitats program. Likewise, the specific backwaters to be treated have not been determined. Two sites, Beal Lake on Havasu NWR and the Ducks Unlimited (DU) Ponds on Imperial NWR are already part of the program and were initially renovated in 2001 and 2003 respectively to remove non-native fish prior to stocking with razorback suckers. Many of the razorback suckers have disappeared from these sites and non-native fish are again infesting both Beal Lake and the DU Ponds. Re-treatment of these sites may occur in FY04 to prepare for restocking with razorback suckers and/or bonytail chub.

The proposed action to renovate the selected sites with rotenone contains provisions to reduce the risk of a bonytail chub or razorback sucker being killed by the toxicant. The sites would be surveyed (using nets, electrofishing, and other appropriate means) intensively prior to the treatment to remove any wild bonytail chub or razorback suckers and, in sites being re-treated, razorback suckers remaining from previous stockings. Experienced fishery personnel would be on site during the treatment to remove any sport fish or listed fish that is found alive during the treatment to a safe holding area. Removal of fish from rotenone-treated water to clean water enables some fish to survive the exposure. Individuals rescued would be held in a safe area until stabilized and then released to a nearby area not involved in the treatment or held in captivity until a release area is identified. After the treatment, personnel will collect any dead bonytail chub and razorback suckers found and the number will be reported to the appropriate office. The remains would be salvaged for scientific purposes or disposed of properly.

STATUS OF THE SPECIES (range-wide)

Bonytail Chub

The bonytail chub (*Gila elegans*) was listed as an endangered species on April 24, 1980 with an effective date of May 23, 1980. The Bonytail Chub Recovery Plan was updated in 1990 (U.S. Fish and Wildlife Service 1990) and Recovery Goals supplementing the 1990 Recovery Plan were approved in 2002 (U.S. Fish and Wildlife Service 2002a). Critical habitat was designated in six river reaches in the historical range of the bonytail chub on March 21, 1994, with an effective date of April 20, 1994. Critical habitat included portions of the Colorado, Green, and Yampa rivers in the Upper Colorado River Basin (Upper Basin) and in Lake Mohave, Lake Havasu, and a portion of the Colorado River above Lake Havasu in the Lower Colorado River Basin (Lower Basin).

The bonytail chub is one of the three closely related members of genus *Gila* found in the Colorado River Basin. Confusion about the proper taxonomy and the degree of hybridization between the bonytail chub, the humpback chub, (*Gila cypha*), and the roundtail chub, (*G. robusta*), has complicated examinations of the status of these fish. The bonytail chub was originally described from specimens taken in Arizona (Baird and Girard 1853). The bonytail chub is a highly streamlined fish with a very thin, pencil-like, caudal peduncle and large, falcate

fins (Allan and Roden 1978). A nuchal hump may be present behind the head. Maximum length is about 600 millimeters (mm), with 300-350 mm more common (U.S. Fish and Wildlife Service 1990). Weights are generally less than one kilogram (kg) (Vanicek and Kramer 1969). Bonytail chub are long-lived fish; some have reached at least 49 years of age (Minckley 1985).

Life History

The bonytail chub was once abundant in the Colorado River and its major tributaries throughout the Basin, occupying 3,500 miles of river in the United States and Mexico (U.S. Fish and Wildlife Service 1993). With the confusion between the bonytail chub and roundtail chub arising from use of the common names "bonytail chub" and "trout" for both species, specific information on abundance is often lacking. However, the FWS is reasonably certain that records from the lower Colorado River were bonytail chub and not roundtail chub. Records from the late 1800's and early 1900's indicated the species was abundant in the lower Colorado and Gila River drainages (Baird and Girard 1853, Kirsch 1889, Gilbert and Scofield 1898, Miller 1961).

With their streamlined bodies, bonytail chub appear to be adapted to the Colorado River and large tributary streams. Even with these adaptations, this species does not select areas of high velocity currents and use of pools and eddies by the fish is significant (Vanicek 1967, Vanicek and Kramer 1969). Grinnell (1914) captured bonytail chubs in a backwater along the lower Colorado River. There is limited information on migrations or other movements.

Spawning takes place in the late spring to early summer (Jonez and Sumner 1954, Wagner 1955) in water temperatures of about 18^0 C (Vanicek and Kramer 1969). Riverine spawning of the bonytail chub has not been documented; however in reservoirs, gravel bars or shelves are used (Jonez and Sumner 1954). Bonytail chub may be flexible in their spawning habitat needs as evidenced by successful spawning in hatchery ponds at Dexter National Fish Hatchery and raceways at Willow Beach National Fish Hatchery.

Habitat needs of larval and juvenile bonytail chubs are not well known. Few larvae have been identified in the Lower Basin; in the Upper Basin, there is confusion between larvae of the bonytail chub and other chubs, so interpreting data is difficult. It is known that young prey on aquatic invertebrates, especially chironomid larvae and mayfly nymphs (Vanicek and Kramer 1969). It is likely that quiet water habitats are preferred habitats for young fish, given the success of raising them in man-made ponds. Backwaters temporarily or permanently connected to the main river channel are also believed to be important habitat for all life stages.

Since 1997, additional information on the number of founders to the bonytail chub broodstock held at Dexter National Fish Hatchery and Technology Center (DNFH&TC) has been developed (Hedrick *et al.* 2000) regarding the amount of genetic variability in the broodstock. The genetic quality of fish produced from the broodstock is suitable for reintroduction; although there is a need to obtain additional wild-born fish to augment the broodstock. The DNFH&TC staff are performing additional genetic analyses and developing a new broodstock based on this genetic information.

Status and Distribution

Bonytail chub continue to decrease range-wide in wild populations due to lack of sufficient recruitment of young adults with the loss of old adults due to natural mortality. Successful recruitment is being prevented by predation and competition from non-native fish species that have been introduced into the Upper and Lower Basins. Loss of the extant wild populations is expected. Extinction of this fish in the wild throughout its historical range is being forestalled by the stocking of sub-adult fish into selected locations in both the Upper and Lower basins.

The Upper Basin's Colorado River Endangered Fishes Recovery Program has coordinated stocking, research, monitoring, and habitat enhancement actions in the Upper Basin since the early 1990's. In the Lower Basin, stocking, research, and monitoring have been accomplished through voluntary conservation actions by Federal and state agencies and implementation of conservation measures and reasonable and prudent alternatives developed under section 7 consultations between the Fish and Wildlife Service and Federal agencies such as Bureau of Land Management and Bureau of Reclamation. These stockings are intended to create populations of reproducing adults to restore populations and provide genetic refuges in accordance with the Recovery Goals.

While it is expected that these young adults will reproduce, the successful recruitment of wild-born young fish to the population may not occur without additional management of habitat and biological factors. Management and research on these populations will be critical to provide for the survival and recovery of the species.

Designated critical habitat in the species' range is occupied by bonytail chub populations. No critical habitat areas are considered pristine or unmodified. Changes to water flow and physical habitat conditions from the pre-development patterns have had significant impacts to habitat quality; however, the areas remain capable of supporting the species at some level. The biological environment has also changed significantly with the introduction of non-native fish species. Non-native fish may be the greatest impediment to survival and recovery of the bonytail chub.

Consultations

The bonytail chub has been the subject of numerous consultations, mostly dealing with the effects of water development projects, river stabilization or channelization works, and recreational developments including stocking of non-native fish.

Razorback Sucker

The razorback sucker (*Xyrauchen texanus*) was first proposed for listing under the ESA on April 24, 1978 as a threatened species. The proposed rule was withdrawn on May 27, 1980 due to changes to the listing process included in the 1978 amendments to the ESA; the amendments

required all listings to be completed within two years of publication of the proposed rule and that deadline was not met. The 1978 amendments also required that critical habitat be included in the listing of most species; however, no critical habitat package was developed for the proposed listing of the species.

In March 1989, the Fish and Wildlife Service was petitioned by a consortium of environmental groups to list the razorback sucker as an endangered species. TheFWS made a positive finding on the petition in June 1989, which was published in the Federal Register on August 15, 1989. The finding stated that a status review was in progress and provided for submission of additional information through December 15, 1989. The proposed rule to list the species as endangered was published on May 22, 1990 and the final rule was published on October 23, 1991 with an effective date of November 22, 1991. The Razorback Sucker Recovery Plan was released in 1998 (U.S. Fish and Wildlife Service 1998). Recovery Goals supplementing the 1998 Recovery Plan were approved in 2002 (U.S. Fish and Wildlife Service 2002b).

Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker on March 21, 1994 with an effective date of April 20, 1994. Critical habitat included portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the Upper Basin, and the Colorado, Gila, Salt, and Verde rivers in the Lower Basin.

The razorback sucker is the only representative of the genus *Xyrauchen* and was described from specimens taken from the "Colorado and New Rivers" (Abbott 1861) and Gila River (Kirsch 1889) in Arizona. This native sucker is distinguished from all others by the sharp edged, bony keel that rises abruptly behind the head. The body is robust with a short and deep caudal peduncle (Bestgen 1990). The razorback sucker may reach lengths of one meter and weigh five to six kg (Minckley 1973). Adult fish in Lake Mohave reached about half this maximum size and weight (Minckley 1983). Razorback suckers are long-lived, reaching the age of at least the mid-40's (McCarthy and Minckley 1987).

Life History

The razorback sucker was once abundant in the Colorado River and its major tributaries throughout the Basin, occupying 3,500 miles of river in the United States and Mexico (U.S. Fish and Wildlife Service 1993). Records from the late 1800's and early 1900's indicated the species was abundant in the lower Colorado and Gila River drainages (Kirsch 1889, Gilbert and Scofield 1898, Minckley 1983, Bestgen 1990).

Adult razorback suckers use most of the available riverine habitats, although there may be an avoidance of whitewater type habitats. Main channel habitats used tend to be low velocity ones such as pools, eddies, nearshore runs, and channels associated with sand or gravel bars (Bestgen 1990). Backwaters, oxbows, sloughs, and flooded bottomlands adjacent to the main channel are also used by this species. From studies conducted in the Upper Basin, habitat selection by adult razorback suckers changes seasonally. They move into pools and slow eddies from November through April, runs and pools from July through October, runs and backwaters during May, and

backwaters, eddies, and flooded gravel pits during June. In early spring, adults move into flooded bottomlands. They use relatively shallow water (ca. 3') during spring, and deeper water (5-6') during winter.

Data from radio-telemetered razorback suckers in the Verde River showed they used shallower depths and slower velocities than in the upper basin. They avoided depths <1.3', but selected depths between 2.0 and 3.9', which likely reflected a reduced availability of deeper waters compared to the larger upper basin rivers. However, use of slower velocities (mean = 0.1'/sec) may have been an influence of rearing in hatchery ponds. Similar to the upper basin, razorback suckers were found most often in pools or runs over silt substrates, and avoided substrates of larger material (Clarkson *et al.* 1993).

Razorback suckers also use reservoir habitat, where the adults may survive for many years. In reservoirs, they use all habitat types, but prefer backwaters and the main impoundment (U.S. Fish and Wildlife Service 1998). Much of the information on spawning behavior and habitat comes from fishes in reservoirs where observations can readily be made. Spawning takes place in the late winter to early summer depending upon local water temperatures. Various studies have presented a range of water temperatures at which spawning occurs. In general, temperatures between 10° to 20° C are appropriate (summarized in Bestgen 1990). They typically spawn over cobble substrates near shore in water 3-10' deep (Minckley *et al.* 1991). There is an increased use of higher velocity waters in the spring, although this is countered by the movements into the warmer, shallower backwaters and inundated bottomlands in early summer (McAda and Wydoski 1980, Tyus and Karp 1989, Osmundson and Kaeding 1989). Spawning habitat is most commonly mixed cobble and gravel bars on or adjacent to riffles (Minckley *et al.* 1991).

Habitat needs of larval and juvenile razorback suckers are reasonably well known. In reservoirs, larvae are found in shallow backwater coves or inlets (U.S. Fish and Wildlife Service 1998). In riverine habitats, they have been found in backwaters, creek mouths, and wetlands. These environments provide quiet, warm water where there is a potential for increased food availability. During higher flows, flooded bottomland and tributary mouths may provide these types of habitats.

Razorback suckers are somewhat sedentary; however, considerable movement over a year by some individuals has been noted in several studies (U.S. Fish and Wildlife Service 1998). Spawning migrations have been observed or inferred in several locales (Jordan 1891, Minckley 1973, Osmundson and Kaeding 1989, Bestgen 1990, Tyus and Karp 1990). During the spring spawning season, razorbacks may travel long distances in both lacustrine and riverine environments, and exhibit some fidelity to specific spawning areas (U.S. Fish and Wildlife Service 1998). In the Verde River, radio-tagged and stocked razorback suckers tend to move downstream after release. Larger fish did not move as much from the stocking site as did smaller fish (Clarkson *et al.* 1993).

Razorback sucker diet varies depending on life stage, habitat, and food availability. Larvae feed mostly on phytoplankton and small zooplankton and, in riverine environments, on midge larvae. Diet of adults taken from riverine habitats consisted chiefly of immature mayflies, caddisflies, and midges, along with algae, detritus, and inorganic material (U.S. Fish and Wildlife Service 1998).

The razorback sucker is adapted to widely fluctuating physical environments characteristic of rivers in the pre-settlement Colorado River Basin. Adults can live 45-50 years and, once reaching maturity between two and seven years of age (Minckley 1983), apparently produce viable gametes even when quite old. The ability of razorback suckers to spawn in a variety of habitats and flows, and over a long season are also survival adaptations. In the event of several consecutive years with little or no recruitment, the demographics of the population might shift, but future reproduction would not be compromised. Average fecundity recorded in studies ranged from 46,740-100,800 eggs per female (Bestgen 1990). With a varying age of maturity and the fecundity of the species, it would be possible to quickly repopulate after a catastrophic loss of adults.

Status and Distribution

Range-wide, the status of razorback sucker is exceedingly poor due to lack of significant recruitment, ongoing habitat loss, and continuing pressure from nonnative species. The range-wide trend for the razorback sucker is a continued decrease in wild populations due to a lack of sufficient recruitment and the loss of old adults due to natural mortality.

Since 1997, significant new information on recruitment to the wild razorback sucker population in Lake Mead has been developed (Holden *et al.* 2000) that indicates some degree of successful recruitment is occurring. This degree of recruitment has not been documented elsewhere in the species' remaining populations, although indications of recruitment exist for the Green River.

Loss of the remaining wild populations is being forestalled by the stocking of sub-adult fish into selected locations in the Upper and Lower basins. The Upper Basin's Colorado River Endangered Fishes Recovery Program has coordinated stocking, research, monitoring, and habitat enhancement actions in the Upper Basin since the early 1990's. In the Lower Basin, stocking, research, and monitoring have been accomplished through the Native Fish Work Group for Lake Mohave, voluntary conservation actions by Federal and state agencies, and implementation of conservation measures and reasonable and prudent alternatives developed under section 7 consultations between the Fish and Wildlife Service and Federal agencies such as Bureau of Land Management and Bureau of Reclamation. These stockings are intended to create populations of reproducing adults to restore populations and provide genetic refuges in accordance with the Recovery Goals.

While stocking activities may prevent the imminent extinction of the species in the wild, they appear less capable of ensuring long term survival or recovery. Studies on the two populations where natural recruitment has or may have occurred (Lake Mead and Green River) are ongoing

to obtain additional information that may be useful for future management that could provide for self-sustaining populations.

Designated critical habitat in the species' range is occupied by razorback sucker populations. No critical habitat areas are considered pristine or unmodified. Changes to water flow and physical habitat conditions from the pre-development patterns have had significant impacts to habitat quality; however, the areas remain capable of supporting the species at some level. The biological environment has also changed significantly with the introduction of non-native fish species. The non-native fish may be the greatest impediment to survival and recovery of the razorback sucker.

Consultations

The razorback sucker has been the subject of numerous consultations, mostly dealing with the effects of water development projects, river stabilization or channelization works, and recreational developments including stocking of non-native fish.

ENVIRONMENTAL BASELINE

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

A. Status of the species in the action area

The proposed action would take place in backwaters on Refuges located on the lower Colorado River. The potential sites vary in size from less than 10 acres to over 200 acres and are all isolated from other backwaters and the mainstem Colorado River. For existing backwaters, this isolation was accomplished naturally (backwaters formed by river meanders left behind as the channel shifted), or artificially (creation of dikes or berms to separate the backwater, blocking natural access channels). Some potential sites were created by excavation. Depth, configuration, and the amount of structure within backwaters vary considerably.

Aquatic submergent plants such as pondweed (*Potamogeton* spp.), water milfoil (*Myriophyllum* sp.), spiny naiad (*Najas marina*), and various algae are found in the backwaters. Emergent plants such as cattails (*Typha* sp.) and bulrush (*Scirpus* sp.) may be found on the shorelines and shallow areas. Vegetation around the backwaters is a mix of non-native and native riparian and upland species that varies considerably between sites and may include salt cedar (*Tamarix* sp.), willow (*Salix* sp.), cottonwood (*Populus fremontii*), and mesquite (*Prosopis* sp.), as well as various shrubs, grasses, and forbs. Some sites have very limited vegetation in the vicinity and others are more well-vegetated.

Bonytail chub are extirpated from portions of the lower Colorado River including the area near Cibola and Imperial refuges. High Levee Pond on the Cibola NWR has a population of bonytail derived from fish stocked in the early 1990's. High Levee Pond is not a backwater that would be considered for treatment under the proposed action. Wild remnant populations exist in the vicinity of Havasu and Bill Williams River refuges; however, the number of these wild fish is extremely small. Augmentation of these wild populations, begun in the mid-1990's, provide opportunity for fish to be found on Havasu or Bill Williams River in any area that has, or has had, recent connection to the river. Portions of Havasu and Bill Williams River refuges are designated as critical habitat. The amount of the extant species range and critical habitat found within the action area is small.

Razorback suckers remain in small, wild populations throughout the lower Colorado River and could be present on all refuges in any backwater with existing or recent connections to the river. In addition, fish from augmentation programs could be found along with the wild fish. Juvenile razorback suckers were specifically stocked into Beal Lake and the DU Ponds and some fish from those stockings remain. Razorback suckers are also present in High Levee Pond. Portions of Cibola and Imperial refuges are designated as critical habitat. The amount of the extant species range and critical habitat found within the action area is small.

B. Factors affecting species' environment within the action area

Management activities on the refuges are varied. Operations for waterfowl and other migratory birds include farming to provide forage crops, irrigation of moist soil areas, and water-level management. Other activities include prescribed burning for marshland maintenance, riparian restoration projects, and managed recreation opportunities. The isolated backwaters that may be selected for the proposed action are also used by migratory and resident wildlife species in concert with other refuge habitats. Most of these ongoing activities have little to no effect on the aquatic habitats or the bonytail chub and razorback sucker. The exception is in water-management activities that could provide ingress to the backwater by non-native fish. An example would be flood irrigating fields with river water and drainage reaching the backwater. All backwaters selected for the isolated habitat program are re-configured or other means are used to prevent water-management activities from affecting the backwater in this way.

The proposed action is a necessary component of a reasonable and prudent alternative being implemented by Bureau of Reclamation under the 1997 biological opinion (USFWS 1997). The alternative calls for the establishment of at least 300 acres of isolated backwater habitats along the lower Colorado River for bonytail chub and razorback sucker. Reclamation is funding the creation or restoration of a portion of these backwaters on FWS refuges with the support of the refuge and the AzFRO. Once completed and functioning, these backwaters will provide a secure refuge for populations of these species to grow and reproduce successfully and contribute to survival and recovery of the species. Elimination of non-native fish from the backwaters prior to stocking is essential to allowing for the survival of the stocked fish and their eventual progeny.

Where re-infestation by non-native fish occurs, additional treatments may be deemed necessary to enable the listed fish populations to continue.

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 a part of a larger action and depend on the larger action for their justification. Interdependent action are those that have no independent utility apart for 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.

The direct effects of the proposed action is injury to, or death of, an unknown number of bonytail chub and razorback suckers from rotenone poisoning of the isolated backwaters. All gill-breathing organisms, including invertebrates used by these fish as food, may be killed by the application of rotenone. Rotenone is not a persistent chemical and breaks down to non-toxic components within a short period of time (dependent on temperature, amount of organic matter and other factors) so there is no long-term affect to physical habitat components. Populations of aquatic invertebrates return to pre-treatment levels within weeks of treatment. Bonytail chub and razorback sucker would not be stocked into treated backwaters until conditions were favorable in terms of food availability and all water quality effects from the rotenone have dissipated.

The number of bonytail chub and razorback sucker in existing backwaters that have not been previously treated is likely to be very small, owing to the small size of the extant populations and the fact that many of these areas are effectively isolated from the river and have been so for some time. However, given that there may be remnant wild fish present, and in many cases the existing barriers are not absolute, the potential for mortality exists. For backwaters such as Beal Lake and DU Ponds, there is a definite risk of mortality to the razorback suckers that were stocked into the backwaters after the initial renovations. The same risk would exist for any other backwaters that were stocked and re-treated during FY04. The conservation measures built into the proposed action reduce the risk of an individual mortality but do not completely eliminate it.

Critical habitat within the action area for bonytail chub is found on those portions of the Havasu and Bill Williams River refuges that are within the 100-year floodplain of the lower Colorado River. This designation includes much of Topock Marsh on the Havasu NWR, including Beal Lake. Office Cove on Bill Williams River NWR is also within the critical habitat boundary and has been used in the past as a grow-out facility for bonytail chub. It is not likely to be included in the proposed action. The primary constituent elements of critical habitat and the potential effects of the proposed action are listed below:

- Water: temporary effects to water quality (toxicity to fish) would occur in the backwaters treated with rotenone.
- Physical habitat: no effects.

- Biological environment: beneficial effects result from the removal of non-native fish species from the backwater as the result of the rotenone treatments.

Critical habitat within the action area for razorback sucker is found on those portions of the Cibola and Imperial refuges that are within the 100-year floodplain of the lower Colorado River. This designation includes several areas on the refuges, including the DU ponds on Imperial NWR. The primary constituent elements of critical habitat and the potential effects of the proposed action are listed below:

- Water: temporary effects to water quality (toxicity to fish) would occur in the backwaters treated with rotenone.
- Physical habitat: no effects
- Biological environment: beneficial effects result from the removal of non-native fish species from the backwater as the result of the rotenone treatments.

No interrelated and interdependent actions have been identified for this 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.

All activities under the proposed action would take place on Federally owned Refuges. No future State or other actions are likely to occur within the action area.

CONCLUSION

After reviewing the current status of the bonytail chub and razorback sucker, the environmental baseline for the action area, the effects of the proposed rotenone treatments, and the cumulative effects, it is the FWS's biological opinion that the rotenone treatment program, as proposed, is not likely to jeopardize the continued existence of the bonytail chub and razorback sucker, and is not likely to destroy or adversely modify designated critical habitat. We present these conclusions for the following reasons:

1. The conservation measures are designed to locate and remove from possible harm as many bonytail chub and razorback sucker as possible before and during the treatment process.

2. The number of individuals likely to be killed or injured is low. Most of the potential mortalities would be of fish raised to be part of a survival and recovery program and would not have significant adverse effects on remaining wild populations.

3. Effects of rotenone treatment to water quality and biological resources used as forage by the fish are temporary and do not have long-term adverse effects on constituent elements of 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, 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 behavioral 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 AzFRO so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, for the exemption in section 7(o)(2) to apply. AzFRO has a continuing duty to regulate the activity covered by this incidental take statement. If AzFRO (1) does not assume and implement the terms and conditions or (2) does not require any 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, AzFRO must report the progress of the action and its impact on the species to AESO as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

The FWS anticipates an unknown number of bonytail chub and razorback sucker will be taken as a result of this proposed action. The incidental take is expected to be in the form of death or physical injury from exposure to the fish toxicant rotenone. The exact number of individuals that may be taken as a result of the proposed action is not definable. This is a result of the uncertainty of which, and how many, backwaters would be treated, and the uncertainty of the number of individuals of either species in those backwaters. However, with the implementation of the conservation measures that are part of the proposed action, and the small number of fish

likely in the potentially affected backwaters, the number of individuals taken should be very low. If the numbers of individuals taken is higher than expected, this would be a concern for the efficiency of the conservation measures and the assumptions on the populations present in the backwaters. To ensure that implementation of the proposed action would halt if incidental take levels were higher than anticipated, a level of 10 total bonytail chub or razorback sucker killed during any one renovation activity implemented as part of the proposed action is set as the authorized limit.

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 species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The conservation measures contained in the proposed action are sufficient to minimize the effects of take from the proposed action. No additional measures are required.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Road, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900 within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We have not identified any conservation recommendations that relate to this proposed action.

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 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 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 AzFRO'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 02-21-04-F-0036 in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ES)
Regional Director, Fish and Wildlife Service, Denver, CO (ES)
Lower Colorado River Coordinator, Fish and Wildlife Service, Phoenix, AZ
Refuge Manager, Havasu National Wildlife Refuge, Fish and Wildlife Service, Needles, CA
Refuge Manager, Bill Williams River National Wildlife Refuge, Fish and Wildlife Service, Parker, AZ
Refuge Manager, Cibola National Wildlife Refuge, Fish and Wildlife Service, Cibola, AZ
Refuge Manager, Imperial National Wildlife Refuge, Fish and Wildlife Service, Yuma, AZ
Project Manager, Arizona Fishery Resources Office, Fish and Wildlife Service, Parker, AZ
Field Office Manager, Fish and Wildlife Service, Carlsbad, CA
Field Office Manager, Fish and Wildlife Service, Ventura, CA
Regional Director, Lower Colorado Region, Bureau of Reclamation, Boulder City, NV

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Appendix A: Concurrences

Bald eagle

The bald eagle will not be affected by the proposed action because:

- Rotenone is not toxic to birds. Fish killed by rotenone are not toxic to birds that eat them.
- Bald eagles are a rare winter visitor to the lower Colorado River with very few individuals reported each year. There are no permanent residents or nesting populations.
- Backwaters identified for the proposed action are not known to be significant foraging areas for this species.
- Although the project would remove non-native prey fish from the backwater, the amount to be treated is extremely small relative to the available foraging area.

Brown pelican

The brown pelican will not be affected by the proposed action because:

- Rotenone is not toxic to birds. Fish killed by rotenone are not toxic to birds that eat them.
- Brown pelicans are uncommon in the lower Colorado River. The transient birds observed are juveniles that stray to the river from the California coast.
- Backwaters identified for the proposed action are not known to be significant foraging areas for this species.
- Although the project would remove non-native prey fish from the backwater, the amount to be treated is extremely small relative to the available foraging area.

Yellow-billed cuckoo

The yellow-billed cuckoo will not be affected by the proposed action because:

- Rotenone is not toxic to birds.
- Yellow-billed cuckoos are rare in the action area and are present as migrants and summer residents in mature cottonwood-willow habitats. Such habitats generally do not occur adjacent to the backwaters likely to be treated, and activities under this proposed action would not be conducted during the time period the cuckoos are present.
- Cuckoos do not forage on fish or aquatic invertebrates.

Southwestern willow flycatcher

The southwestern willow flycatcher may be affected, but will not likely be adversely affected, by the proposed action because:

- Rotenone is not toxic to birds.
- Southwestern willow flycatchers are found in the action area as migrants and residents. Their habitat is in dense willow or saltcedar stands. Such stands may be located in the vicinity of the backwaters. However, activities under this proposed action would not be conducted during the time period the flycatchers are present.

- Rotenone does kill larvae and nymphs of aquatic insects that, as adults, may provide food sources for the flycatcher. The kill is generally not complete, leaving some individuals to survive and repopulate the area. The invertebrate populations rebound within a few months. Further, the areal extent of the treatment is extremely small relative to the available foraging area.

Yuma clapper rail

The Yuma clapper rail may be affected, but will not likely be adversely affected, by the proposed action because:

- Rotenone is not toxic to birds. Fish and invertebrates killed by rotenone are not toxic to birds that eat them.
- Yuma clapper rails are found on the Refuges as permanent residents. Rail habitat may be in proximity to treated backwaters and there is a potential for disturbance (noise, odors from the rotenone mixture, human presence) to those residents. This is not expected to be significant since actual habitat will not be affected, allowing rails to maintain cover and distance from the disturbance.
- Rotenone does kill aquatic insects and other invertebrates, including crayfish (an important food of the rail). The kill is generally not complete, leaving some individuals to survive and repopulate the area. The invertebrate populations rebound within a few months. Further, the areas extent of the treatment is extremely small relative to the local foraging area available to the rails.