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In Reply Refer To:
AESO/SE
22410-2006-F-0334

March 27, 2006

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 06

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 March 27, 2006, and received by us on March 27, 2006. 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 Refuge (Refuges) on the lower Colorado River in La Paz, Mohave, and Yuma Counties, Arizona and San Bernardino and Imperial Counties, California. Any rotenone treatments would be undertaken by Arizona Fishery Resources Office (AzFRO) personnel under the Pesticide Use Proposal (PUP). The proposed action may adversely affect the endangered bonytail (*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*), 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. We also concur with your finding of “may affect, not likely to adversely affect” for the Yuma clapper rail (*Rallus longirostris yumanensis*). The explanations for our concurrences are given in Appendix A to this biological opinion.

This biological opinion is based on information provided in the March 20, 2006, intra-Service section 7 evaluation forms, 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

- The intra-Service evaluation form was dated March 20, 2006, and was signed by the AzFRO Project Leader. AESO received the request for consultation with with evaluation form on March 27, 2006.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the renovation to remove all non-native fish from selected backwaters through treatment using the fish toxicant rotenone on one or more of the Refuges on the lower Colorado River in Arizona and California during Fiscal Year 2006 (FY06).

The proposed action is defined by the PUP filed by AzFRO with the FWS Regional Office to renovate isolated backwaters on the Refuges to remove all non-native fish species prior to the backwaters being stocked with bonytail and/or 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 and razorback sucker and would interfere with the function of the backwaters as protected habitats for the two listed fish species. Establishment of some 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. Other protected backwaters on a Refuge were established as part of our commitment to recovery for native fish species.

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 PUP. 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 FY06 has not been determined and will be dependent on progress made in planning for implementation of the protected habitats program. Likewise, all 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 disappeared from Beal

Lake and non-native fish are again infesting Beal Lake. Re-treatment of Beal Lake will occur in FY06 to prepare for restocking with razorback suckers and/or bonytail.

The proposed action to renovate the selected sites with rotenone contains provisions to reduce the risk of a bonytail 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 as any bonytail or razorback suckers and in sites being re-treated, or treated for the first time. Experienced fishery personnel would be on site during the treatment to remove to a safe holding area listed fish that is found alive during the treatment. 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 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

The bonytail 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 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 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).

Please refer to USFWS 2005 for a summary of the status of the bonytail in the Colorado River Basin.

Consultations

The bonytail 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. The species is also covered by the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) (LCR MSCP 2004)

Razorback Sucker

The razorback sucker was listed as an endangered species on October 23, 1991 with an effective date of November 22, 1991. The Razorback Sucker Recovery Plan (USFWS 1998) was developed and updated by the Recovery Goals (USFWS 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

Please refer to USFWS 2005 for a summary of the status of the razorback sucker in the Colorado River Basin.

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. The species is also covered by the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) (LCR MSCP 2004)

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 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 or the mainstem Colorado River. For existing backwaters, this isolation was accomplished naturally (backwaters formed by river meanders then left behind as the channel shifted), or artificially (creation of dikes or berms to separate the backwater, blocking of natural access channels). Some potential sites were created by excavation. Depths, configuration and amount of structure within the backwater 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 better vegetated.

Bonytail are extirpated from portions of the lower Colorado River including the river 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. Wild remnant populations exist in the vicinity of Havasu and Bill Williams River refuges; however, the number of these wild fish is extremely small. Augmentations begun in the mid-1990's to these wild populations 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. Bonytail stocked into Lake Havasu have been found in the river near Havasu NWR. 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 backwaters that may be treated under this proposed action 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 some fish from that stocking may 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 backwaters that may be treated under this proposed action 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 to that 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 accomplished to prevent water management activities from affecting the backwater in this way.

The proposed action is a necessary component of a biological opinion reasonable and prudent alternative being implemented by Bureau of Reclamation under the 1997 biological opinion (USFWS 1997). Continued implementation of this component is continuing under the LCR MSCP. The alternative called for the establishment of at least 300 acres of isolated backwater habitats along the lower Colorado River for bonytail 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, which 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 actions 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 are injury to or death of an unknown number of bonytail 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 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 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 Cibola High Levee Pond, there is a definite risk of mortality to the remaining individuals 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 FY06. 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 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. Implementation of the proposed action would have temporary effects to water quality in any backwater treated with rotenone. Water quality would not be permanently affected. There would be beneficial effects to the biological environment constituent element through the elimination of non-native fish species from the selected backwaters.

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 Cibola and Imperial NWR. Implementation of the proposed action would have temporary effects to water quality in any backwater treated with rotenone. Water quality would not be permanently affected. There would be beneficial effects to the biological environment constituent element through the elimination of non-native fish species from the selected backwaters.

No identified 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 Federal lands owned Refuges. No future State or other actions are likely to occur within the action area on the Refuges.

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 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 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 intra-Service evaluation form and summarized 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 further 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) fails to assume and implement the terms and conditions or (2) fails to 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 FWS as specified in the incidental take statement. [50 C.F.R.§402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

The FWS anticipates an unknown number of bonytail 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 that the number of individuals of either species in those backwaters is not known. 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 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 or razorback sucker killed during any one renovation activity implemented as part of the proposed action is set as an upper allowed 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 those that would have been included as reasonable and prudent measures and are sufficient to minimize the level of take from the proposed action.

Review Requirement

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the 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. AzFRO must immediately provide an explanation of the causes of the taking and review with 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'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 me at (602) 242-0210 (x244) or Lesley Fitzpatrick (x236). Please refer to the consultation number 22410-2006-F-0334 in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Regional Director, Southwest Region, Fish and Wildlife Service, Albuquerque, NM
(Attn: Ecological Contaminants: Laila Lienesch)
Refuge Manager, Havasu NWR, Fish and Wildlife Service, Needles, CA
Refuge Manager, Bill Williams River NWR, Fish and Wildlife Service, Parker, AZ
Refuge Manager, Cibola NWR, Fish and Wildlife Service, Cibola, AZ
Refuge Manager, Imperial NWR, Fish and Wildlife Service, Yuma, AZ
Project Coordinator, AzFRO, Fish and Wildlife Service, Parker, AZ
Regional Director, Lower Colorado Region, Bureau of Reclamation, Boulder City, NV (LC-8000)

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (Bob Broscheid)
Joe Millosovich, California Department of Fish and Game, Blythe, CA

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- U.S. Fish and Wildlife Service. 1998. Razorback Sucker (*Xyrauchen texanus*) Recovery Plan. U.S. Fish and Wildlife Service. Denver, Colorado. 81 pp.
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- U.S. Fish and Wildlife Service. 2005. Biological Opinion for Lower Colorado River Multi-Species Conservtion Program. Arizona Ecological Services Office, Phoenix. For Bureau of Reclamation, Boulder City, Nevada, and Fish and Wildlife Service, Albuquerque, New Mexico

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 get blown 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 will not be 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 be managed to not affect nesting habitats and noise from treatment activities is not a factor.
- 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, providing individuals to 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 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, smells, 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, providing individuals to repopulate the area. The invertebrate populations rebound within a few months. Further, the areal extent of the treatment is extremely small relative to the local foraging area available to the rails.