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AESO/SE
2-21-95-F-216R

April 30, 2002

Memorandum

To: Regional Director, Lower Colorado Region, Bureau of Reclamation, Boulder City, Nevada

From: Field Supervisor

Subject: Reinitiation of Formal Section 7 Consultation on Lower Colorado River Operations and Maintenance - Lake Mead to Southerly International Boundary, Arizona, California and Nevada

This biological opinion responds to your request for consultation with the U.S. Fish and Wildlife Service 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 March 29, 2002, and received by us on April 1, 2002. At issue are impacts that may result from the Bureau of Reclamation's (Reclamation's) operations and maintenance activities on the lower Colorado River (LCR) from Lake Mead to the Southerly International Boundary with Mexico in Mohave, La Paz and Yuma counties, Arizona, San Bernardino, Riverside and Imperial counties, California, and Clark County, Nevada. The species of concern for this consultation are the bonytail chub (*Gila elegans*), razorback sucker (*Xyrauchen texanus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and Yuma clapper rail (*Rallus longirostris yumanensis*), and designated critical habitat for the bonytail chub and razorback sucker.

Contained in Reclamation's request for formal consultation was a finding of "may affect, not likely to adversely affect" for the Yuma clapper rail. The Service, in our memorandum acknowledging receipt of the request, informed Reclamation that we did not concur with that finding, and that the effects of the proposed action on the Yuma clapper rail warranted a "may affect, likely to adversely affect" finding. This discussion is the same as was held in 1996 for the original consultation on Reclamation's operations and maintenance. The result of those discussions was the inclusion of the Yuma clapper rail in the 1997 biological opinion (BO). The Yuma clapper rail will be included as a species considered in this BO.

This BO is based on information provided in the March 26, 2002 Biological Assessment (BA) (USBR 2002), the 1996 BA (USBR 1996), the April 30, 1997 BO for the project (USFWS 1997), annual reports from Reclamation on implementation of Reasonable and Prudent Alternatives (RPA) and Reasonable and Prudent Measures (RPM) from the 1997 BO on this project (USBR 1998, 1999a, 2000a, 2002), section 7 compliance for other actions along the LCR completed since May 1997, discussions between the Service and Reclamation, and other sources of information. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, river or reservoir management activities and 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 Service issued a BO for Reclamation's operations and maintenance activities on the LCR on April 30, 1997. That BO found jeopardy for the bonytail chub, razorback sucker and southwestern willow flycatcher and adverse modification of critical habitat for the two listed fish species. No jeopardy was found for the Yuma clapper rail. A multi-provision RPA was provided in the BO. The BO covered 5 years of those ongoing and continuing operations (to April 30, 2002). The term of the 1997 BO was predicated on the completion of the Lower Colorado River Multi-Species Conservation Program (LCR-MSCP), a habitat conservation plan (HCP) under section 10 of the ESA, to cover non-Federal uses of Colorado River water and generated power by the States of Arizona, California and Nevada. Federal actions by Reclamation and other Federal agencies who wished to be part of the program would also be part of the LCR-MSCP, with the conservation plan providing for RPAs, RPMs, Terms and Conditions (T&Cs), Conservation Recommendations (CR) or Conservation Measures (CMs) for those activities under section 7. The BO stated that if the LCR-MSCP was not completed before the end of the 5-year period covered by the consultation, then reinitiation of consultation on Reclamation's operations and maintenance activities would be necessary.

Work on development of the LCR-MSCP has continued since issuance of the 1997 BO. However, due to the complexity of the river management questions including the Law of the River, and the involvement of three States with differing water needs and legal frameworks, the process has taken longer than expected. Also, a new primary contractor for the preparation of the necessary documents was hired in 2000.

Concerns about the LCR-MSCP schedule for completion were discussed between the Service, Reclamation and the MSCP Steering Committee on many occasions. Based on these discussions, Reclamation determined that a three-year extension of time to allow for completion of the LCR-MSCP would be prudent based on the progress made to date. The Service and Reclamation discussed the draft BA and a schedule to complete the consultation in a telephone

conference on March 20, 2002. The March 26, 2002 BA was received by the Service on April 1, 2002 along with the March 29, 2002 request for initiation of formal consultation.

A draft BO was provided to Reclamation on April 12, 2002 and comments dated April 25, 2002 were received on April 27, 2002. Comments were incorporated and the final BO prepared.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

This reinitiation is to provide coverage for three years for Reclamation's discretionary activities on the LCR. The period of additional coverage would be from April 30, 2002 to April 30, 2005. The proposed river operations and management activities for this reinitiation are those described in Reclamation's 1996 BA (USBR 1996) and updated in the 2002 BA (USBR 2002). The information in those documents is incorporated herein by reference. As with the 1997 consultation, the only activities covered by this extension are Reclamation's discretionary actions on the LCR. Non-discretionary Federal actions, and all State and private actions associated with the LCR are not part of the covered actions included in the consultation but are considered as appropriate in the environmental baseline and in cumulative effects sections. As discussed in the 2002 BA, the reinitiation does not cover any potential operations of the Yuma Desalting Plant, since none are expected before April 30, 2005. Section 7 consultations completed since 1997 on Reclamation programs for offstream water storage, interim surplus criteria for Lake Mead operations, and the change in point of diversion of up to 400,000 acre-feet (af) of California apportionment water have altered management direction from what had been described in the 1996 BA. These actions are discussed in the environmental baseline section of this BO since consultation has been completed for these projects.

In addition to changes in management, Reclamation has made progress on conservation actions listed in the 1996 BA. Some of these activities have a section 7(a)(1) focus for endangered and threatened species conservation while others are directed to wildlife conservation in general. Conservation actions continuing through the April 30, 2005 period are part of this consultation. The 2002 BA contains the pertinent information on these continuing actions and is incorporated herein by reference.

The project description in the 2002 BA also includes some of the RPAs from the 1997 BO as conservation measures. Because the requirements of some RPAs and RPMs have been completed, there is no need to carry them forward into the 2002-2005 period. Minor modifications to the 1997 RPAs, as agreed to by the Service and Reclamation, have been incorporated into the conservation measures. In addition, Reclamation has included two new conservation measures as part of the proposed action. To clarify which RPA provisions are completed, continuing, or modified, the Service has listed each individually below. The 2002 BA does not present this information in the same format.

The following RPA provisions were completed within the 1997-2002 period covered by the 1997 BO. Additional efforts under these RPA provisions are not needed for this consultation. All reports required under these RPA provisions have been provided to the Service:

1. RPA 2: the review and evaluation of Reclamation fish and wildlife programs to maximize bonytail chub and razorback sucker conservation has been completed.
2. RPA 5: the 1400 acres of suitable southwestern willow flycatcher habitat has been acquired by Reclamation. Because suitable habitat was acquired, no restoration of these habitats is required under the RPA.
3. RPA 6: the review and evaluation of Reclamation fish and wildlife programs to maximize southwestern willow flycatcher conservation has been completed.
4. RPA 10: research on Lake Mead razorback sucker populations was supported through 2002. Funding for work on Lake Mead beyond 2002 is part of the conservation measures included in the Lake Mead Interim Surplus Criteria project and additional funding is not needed under this consultation for the 2002-2005 period.
5. RPA 13: the report on Reclamation's degree of discretion in river operations and maintenance activities has been completed.

The following RPA provisions are those Reclamation will continue to implement as conservation measures through April 30, 2005. Except for the time period covered, there is no difference between the original RPA and the conservation measure for these provisions:

1. RPA 4: research funding for native and non-native fish interactions will be provided.
2. RPA 7: protective management actions for southwestern willow flycatcher habitat will be continued.
3. RPA 9: support for bonytail chub reintroduction into the LCR will be provided if requested by the Service.
4. RPA 12: Reclamation will continue to be an active participant in the LCR-MSCP development process.
5. RPA 14: the report on restoration opportunities has been provided to the Service and Reclamation will continue to monitor the ecological restoration demonstration areas over the next three years.
6. RPA 15: interagency agreements needed for RPA (conservation measure) implementation will be developed as needed.

7. RPA 17: reinitiation of consultation on Reclamation's discretionary actions if the LCR-MSCP is not completed. This would be required under the section 7 regulations since coverage for these actions will lapse after April 30, 2005.

Several RPA provisions were clarified or amended by mutual agreement of Reclamation and the Service. These are included as conservation measures in their amended form through April 30, 2005:

1. RPA 1: the time to complete the stocking of approximately 40,000 razorback suckers remaining of the original 50,000 commitment below Parker Dam was extended.
2. RPA 3: this RPA called for the building of 300-600 acres of native fish impoundments, it did not specify that they would have fish in them at the end of the BO period. This provision is herein modified such that at least one-half of the pond acreage will have native fish in place by April 30, 2004 with the remaining acreage having native fish in place by April 30, 2005.
3. RPA 8: this RPA did not provide for the Service to receive the draft survey reports from the contractor or Reclamation in order to review the draft and provide comments for consideration in finalizing the report. This requirement is added to the provision. Surveys will continue for the additional three years as described in the RPA and annual reports.
4. RPA 11: this RPA was directed to evaluate the amount of historic southwestern willow flycatcher habitat that existed along the LCR. A report was prepared and Reclamation determined that its responsibilities under this RPA were met by transmission of the report to the Service and the LCR-MSCP. Full implementation of this RPA will be considered under the LCR-MSCP during the next three years.
5. RPA 16: this RPA called for an annual report of progress on implementation of RPAs to the Service and included a public presentation of the results. This annual report will continue to be provided to the Service. The requirement for a public presentation of the report is dropped; however, the report should be made available to the public.

Reclamation has included two new conservation measures as part of the proposed action for the next three years. The first would be to conduct a study to determine movements and fate of razorback suckers stocked into the LCR below Parker Dam. This information will assist in documenting razorback sucker habitat use areas to assist in future management. This conservation measure would be accomplished in conjunction with the ongoing razorback sucker stocking. The study protocol will be developed by Reclamation with input from the Service.

The second conservation measure involves a study to assess the effectiveness of cowbird trapping for southwestern willow flycatcher conservation along the LCR. Cowbird trapping has been accomplished over the 1997-2002 period as part of RPA 8 and RPM 2.1. With the

information learned from those efforts (described in the 2001 annual report contained in the 2002 BA), the proposed study will focus on whether cowbird trapping does affect flycatcher nest success. This will be useful in defining future conservation. The study protocol will be developed by Reclamation with input from the Service. Cowbird trapping efforts under other biological opinions will continue as called for in those opinions until this issue of effectiveness is resolved.

Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR§402.02). Reclamation's discretionary activities in this consultation are largely restricted to the LCR channel and immediate floodplain, with some facilities operations and conservation actions taking place outside of the floodplain. As in the 1997 BO, the action area for this reinitiation does not include areas outside the floodplain not directly involved with a Reclamation discretionary action described in the 1996 or 2002 BA. The action area for this reinitiation is thus the same as used in the 1997 BO and consists of the LCR and 100-year floodplain from the upper extent of Lake Mead to the Southerly International Boundary with Mexico. Reclamation facilities outside of the 100-year floodplain, such as at Senator Wash Reservoir and lands in the 242 wellfield and ancillary facilities near Yuma, Arizona are also included in the action area.

STATUS OF THE SPECIES/CRITICAL HABITAT (RANGE-WIDE)

This section provides brief summaries of the status of the listed species and critical habitat that would be affected by the proposed action. Recovery plans, if one exists, are cited for each species in the appropriate section. In the interest of brevity, extensive information on species life history and range wide distribution is not contained in this document, but is in documents cited in the appropriate section. This information is incorporated by reference.

Species/Critical Habitat Description

Bonytail chub

The bonytail chub was listed as an endangered species on April 24, 1980, with an effective date of May 23, 1980. The Bonytail Chub Recovery Plan was most recently updated in 1990 (USFWS 1990).

Critical habitat was designated in six river reaches in the historic range of the bonytail chub on March 21, 1994, with an effective date of April 20, 1994. Critical habitat in the action area is the mainstem Colorado River from Hoover Dam to Davis Dam including Lake Mohave to its full pool elevation and the river and 100-year floodplain between the northern boundary of the

Havasu National Wildlife Refuge and Parker Dam including Lake Havasu to its full pool elevation. All critical habitat areas were considered occupied at the time of designation. Constituent elements include water, physical habitat and biological environment.

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 was released in 1998 (USFWS 1998).

Critical habitat was designated in 15 river reaches in the historic range of the razorback sucker on March 21, 1994 with an effective date of April 20, 1994. Critical habitat in the action area is Lake Mead to its full pool elevation, the Colorado River and its 100-year floodplain between Hoover Dam and Davis Dam including Lake Mohave to its full pool elevation and the Colorado River and its 100-year floodplain from Parker Dam to Imperial Dam. All critical habitat areas were considered occupied at the time of designation. Constituent elements include water, physical habitat and biological environment.

Southwestern willow flycatcher

The southwestern willow flycatcher was listed as endangered, without critical habitat, on February 27, 1995. Critical habitat was designated on July 22, 1997 (and set aside on May 11, 2001 by court order), but no critical habitat units were designated in the action area for this consultation. The draft recovery plan was recently provided for public review (USFWS 2001a).

Yuma clapper rail

The Yuma clapper rail was listed as an endangered species on March 11, 1967 under endangered species legislation enacted in 1966 (Public Law 89-669). Only populations in the United States are protected under the ESA; those in Mexico are not. Critical habitat has not been designated for this species. The Yuma Clapper Rail Recovery Plan was released in 1983 (USFWS 1983).

Life History

Bonytail chub

Life history information on the bonytail chub can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997), the recovery plan (USFWS 1990), and through background information provided in recent documents (SWCA 2001a). 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) that has provided information on 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 the second broodstock.

Razorback sucker

Life history information on the razorback sucker can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997), the recovery plan (USFWS 1998), and through background information provided in recent documents (SWCA 2001b). 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.

Southwestern willow flycatcher

Life history information on the southwestern willow flycatcher can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997). Since 1997, significant new information on the species has been developed as a result of research and monitoring efforts. This information was summarized in the Interim Surplus Criteria /Secretarial Implementation Agreements (ISC/SIA) and Conservation Measures BO issued by the Service on January 12, 2001 to Reclamation (USFWS 2001b). Information from that document is incorporated herein by reference. Biological information is also summarized in the draft recovery plan (USFWS 2001a).

Yuma clapper rail

Life history information on the Yuma clapper rail can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997), the recovery plan (USFWS 1983), and in other life history summaries (Eddleman 1989, Todd 1986). New information regarding the Yuma clapper rail involves selenium levels in prey species (Roberts 1996, King *et al.* 2000). Selenium levels in crayfish were high enough to cause concern for potential reproductive effects in clapper rails. No adverse effects have been noted, but because of the species' secretive nature, nests are difficult to find and thus reproductive effects are difficult to document. Additional research and monitoring are under consideration to further examine this potential problem. Research on cattail marsh management for clapper rails using prescribed fire is ongoing in California and along the LCR.

Species Status and Distribution

Bonytail chub

Range-wide status and distribution information can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997, USFWS 2001b). Additional information on the bonytail chub is available (SWCA 2001a).

The range-wide trend for the bonytail chub is for a continued range-wide decrease in wild populations due to lack of sufficient recruitment of young adults with the loss of old adults due to natural mortality. Loss of the extant wild populations is expected. Extinction of this fish in the wild throughout its historic range is being forestalled by the stocking of sub-adult fish into the Upper Colorado River Basin, and lakes Mohave and Havasu in the LCR. These stockings are intended to create populations of young adults that may be expected to persist for 40-50 years. 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. Of vital importance to the stocking program is maintenance and enhancement of the existing bonytail broodstock. Genetic evaluation of the existing F1 population is underway to assist in formulating a new broodstock. Infusion of additional, unrelated wild individuals is being actively pursued in order to maximize the amount of genetic variability in the broodstock. Captive born individuals from the original F1 and F2 breedings that have survived in the wild are also under consideration for inclusion.

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. The non-native fish may be the greatest impediment to survival and recovery of the bonytail chub.

Razorback sucker

Range-wide status and distribution information can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997, USFWS 2001b). Additional information on the razorback sucker is available in the draft recovery goals documents (SWCA 2001b).

Extinction of the species in the wild throughout the historic range is being forestalled by stocking of sub-adult fish into the remaining wild populations. However, the range-wide trend for the razorback sucker is for a continued decrease in wild populations due to lack of sufficient recruitment of young adults and the loss of old adults due to natural mortality. Where natural recruitment is occurring, it is not known if the current level of recruitment will sustain the

existing population levels. Where recruitment is not occurring, loss of the remaining wild populations is expected. Stocking efforts in the Upper Colorado River Basin, and in lakes Mohave and Havasu and the LCR below Parker Dam are ongoing, with the 30,000 fish requirement for Lake Havasu completed in 2001. The most critical of these efforts is the replacement of the Lake Mohave population using wild-caught larvae from the lake. By the end of 2001, the initial goal to stock 50,000 sub-adult fish into Lake Mohave was reached (Tom Burke, Reclamation, pers. comm.). The Lake Mohave efforts will continue to meet the second goal, which is to establish a population of 50,000 adults. Studies on the two populations where natural recruitment has been documented (Lake Mead and the 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.

Southwestern willow flycatcher

Range-wide status and distribution information can be obtained in documents previously incorporated by reference in this BO (USBR 1996, USFWS 1997, USFWS 2001a).

The current estimate of the range-wide southwestern willow flycatcher population is between 1,100 and 1,200 pairs/territories (USFWS 2001a). Intensive monitoring and survey efforts since the species was listed has significantly increased the known number of pairs/territories since the species was listed. Although numbers have increased in some areas, much of this increase may be an artifact of more survey effort. There has been a continuing degradation and loss of occupied habitat due to various actions. Protection of occupied habitats to offset losses elsewhere through RPAs and RPMs developed as part of section 7 consultations on Federal actions provides stability for those protected populations but there may still be a net loss of birds or habitat on a range-wide level. Many section 7 consultations contain requirements to restore or replace habitats lost. Most past efforts to restore cottonwood-willow habitats were not designed to provide flycatcher habitats. While recent efforts have been more focused on flycatcher habitat, the stands are still too young to provide habitat. This has resulted in efforts to protect currently unprotected suitable habitats to meet consultation requirements. Success with restoration is critical to the continuation of requiring restoration to offset losses of habitat since the amount of available, unprotected but suitable/occupied habitat is limited.

Yuma clapper rail

The status of the Yuma clapper rail since 1997 is provided by results of annual surveys (Table 1). These surveys do not provide complete population estimates, but are representative of the minimum number of birds found at survey sites. Survey data covers portions of the LCR, central Arizona, and the Salton Sea in California. Declines noted in total numbers over the 4-year period cannot be used to document actual population declines and may have several origins. Changes in survey effort from year to year as well as changes to survey protocol have an effect to numbers. Population changes on a local level have been noted, but these may be based on changes in habitat quality. A decline in habitat quality may be the result of aging of existing cattail stands to a less suitable condition for rail occupancy. Historically, the LCR marshes seldom accumulated large amounts of dead material because of floods and changes to the river channel that washed away such stands on a repeating cycle. Management actions such as burning old cattail stands and selective dredging to open up too-dense patches are management actions either under consideration or ongoing to assess the question of habitat quality and the best means to restore it. The Salton Sea NWR has burned overgrown cattail habitats and similar projects on the Havasu NWR and at Mittry Lake have been initiated. Results of these efforts are not yet available. We do have information that suggests the clapper rail is extending its range northward into Lake Mead (McKernan and Braden 2001a) and southern Nevada. The range of the clapper rail in the Bill Williams/Big Sandy River drainage in west central Arizona has been extended by the discovery of at least two pairs of clapper rails near Wikieup (BLM, pers. comm.).

Although not part of the listed population, the large population of Yuma clapper rails in Mexico is very important for the long-term viability of the species. The extent to which the U.S. and Mexico populations interchange adults or dispersing juveniles is not known. The Cienega de Santa Clara, once part of the wetland/riverine/estuarine complex of the LCR Delta, is home to the largest population of Yuma clapper rails. Estimates by researchers indicate a population of up to 6,000 birds (Hinojosa-Huerta *et al.* 2000). The Cienega de Santa Clara is cut off from the LCR and the Sea of Cortez and is largely supported by drainage from the Main Outlet Drain Extension (MODE) which isolates and transports saline drainage water from the Wellton-Mohawk Irrigation District in the U.S. to the Cienega as part of the Salinity Control Program to maintain water quality of LCR water delivered to Mexico. This water supply is not guaranteed for the future, and is dependent upon the Yuma Desalting Plant not treating the MODE water and making it available for other purposes.

Analysis of the Species/Critical Habitat Likely to be Affected

The proposed action would take place in occupied habitats for the bonytail chub, razorback sucker, southwestern willow flycatcher and Yuma clapper rail, and within designated critical habitat for the two fish species. The LCR supports the largest remaining populations of bonytail chub and razorback sucker in the wild, is an important breeding and recovery habitat area for the

southwestern willow flycatcher, and supports half of the listed Yuma clapper rail population. Long-term survival and recovery of all these species will require these habitats to be able to support these species at current or higher levels.

ENVIRONMENTAL BASELINE

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

The 1996 BA and 1997 BO contained extensive information to describe the environmental baseline for the action area. That information is incorporated herein by reference. Most of Reclamation's discretionary actions included in the proposed action were first implemented prior to the 1997 consultation and are considered in the environmental baseline. The effects of those actions to the river ecosystem resulted in the physical and biological conditions existing in the LCR and its 100-year floodplain at the present time. For some physical conditions, such as sediment transport and channel incisement, equilibrium has not been reached in some reaches and additional changes to the river will occur in the future as equilibrium is reached. These changes are part of the baseline even though they have not yet occurred.

Discretionary actions covered in the 1997 BO have continued to be implemented since 1997, and the effects of that implementation are also represented in the baseline for this reinitiation BO. The 2002 BA contains a summary of the water management operations and river maintenance actions taken in the 1997-2001 period that are now part of the baseline. In addition, formal and informal consultations have been completed for projects in the action area and these are also included as part of the baseline. In section A below, the status of the species includes the effects of RPAs, RPMs, Interim Conservation Measures (ICM) and other beneficial activities for the species initiated or completed since 1997. Most of these benefits have dealt with augmentation of populations, protection of existing habitat, research into how to address threats, potential habitat enhancement methodology, and monitoring of populations. In section B we will focus on the effects to the habitat that have occurred since the 1997 environmental baseline was written.

A. Status of the species in the action area

Bonytail chub

A total of 26,826 sub-adult fish have been stocked into Lake Mohave since 1997 (Table 2). There is evidence of survival; a 276 millimeter (mm) female stocked within the previous year was captured in May, 2001 (Chuck Minckley, USFWS, pers. comm.). The number stocked is well under the 125,000 sub-adults that needed to be stocked by 1999 by the Service as part of the commitment in the rainbow trout stocking BO (USFWS 1994). Approximately 4,500 sub-adult fish have been stocked into Lake Havasu since 1997 (AGFD data). These fish are part of the 30,000 required to be stocked by 2003 under the Lake Havasu Fisheries Improvement Project.

Three fish have been recaptured from Lake Havasu during agency surveys, and there is an undocumented record of an angler catching one (Chuck Minckley, USFWS, pers. comm.). Conservation activities of Reclamation and the LCR-MSCP (through ICMs) have contributed to these efforts to stock fish. It is important to note that stocking goals in the Mohave and Havasu programs have not met original projections due to the difficulty in raising bonytails to the desired stocking size. Efforts to refine rearing techniques are underway to increase stocking capacity, as is the development of additional rearing facilities.

The wild-born bonytail population in the LCR has continued to decline over the period as these fish die of old age. Fewer fish that can be identified as wild-born adults are captured during the spring roundups and broodstock acquisition efforts. Stocked fish are captured during these efforts in Lake Mohave and Lake Havasu, documenting a level of success from these efforts that is keeping the species from extirpation.

Razorback sucker

Approximately 400 razorback suckers live in Lake Mead and are the result of successful natural recruitment to the population. The original Lake Mead population died off by the late 1970's, but there was some recruitment to provide for this second generation. Based on results of aging these fish, recruitment events in the 1980's and 1990's have occurred. Sub-adults from natural recruitment are being caught on the spawning grounds with older wild adults. In addition to the natural recruitment, there is a limited augmentation of wild-born but hatchery reared sub-adults to this population. Ongoing research is also placing some older captive reared individuals into the lake to assist in locating new spawning groups.

By January 2002, 55,667 sub-adult razorback suckers had been stocked into Lake Mohave, 48,745 of them since 1997 (Tom Burke, Reclamation, pers. com.) (Table 2). Work on this effort is continuing to meet the desired population goal of 50,000 individuals. One important note of clarification from the 1997 BO is needed. In that BO, the Native Fish Work Group Lake Mohave effort [a section 7(a)(1) undertaking by Reclamation and other agencies] and the Service's section 7 (a)(2) requirement to stock 50,000 razorback suckers into Lake Mohave under the rainbow trout stocking BO (USFWS 1994) were assumed to be separate efforts. This is not the case, so the 2 projects are not additive as was assumed in 1997. Stocking into Lake Havasu was completed in 2001 with 30,000 sub-adults stocked, most of those were stocked after 1997. Reclamation also has 50,000 razorback suckers to stock below Parker Dam as part of the RPA from the 1997 BO. An additional 20,000 razorback suckers for this program was a part of the ISC/SIA consultation (USFWS 2001). A total of 9,138 fish have been stocked to date below Parker Dam. Funding from Reclamation and the LCR-MSCP have contributed significantly to the progress made on these projects since 1997.

Wild born adult razorbacks continue to die of old age in the Mohave, Havasu and lower river populations. The populations of wild-born adults in Lake Havasu and the lower river is extremely small and that in Lake Mohave is less than 10,000. The Lake Mead population is

young enough that age-related mortality is not a significant factor at this time, but it is unclear if the current rate of recruitment can sustain the population at the present level or provide for expansion. Augmentations to the remaining populations will provide young adults to the system, but natural recruitment into these populations is not certain. Repatriated razorbacks do appear on the spawning grounds in Lake Mohave and some have reached maturity. A spawning aggregation made up of these stocked fish was identified in the northern portion of Lake Havasu in 2001. Razorback sucker larvae were collected in 2001 from two sites near Topock Marsh.

Endocrine dysfunction as a result of personal care product residues in treated effluent has been raised as a concern regarding some aquatic species. In Lake Mead, carp from the Las Vegas Bay area are affected and there is continuing research on Lake Mead to assess any potential effects to razorbacks. Additional studies are beginning in the lower river. This may become a larger issue in the future.

Southwestern willow flycatcher

The most recent published report (McKernan and Braden 2001b) is for 2000 data. For the LCR within the action area, 55 southwestern willow flycatchers were recorded. The Topock Marsh group is the largest (32 birds recorded), the remainder are scattered from the Lake Mead to the SIB at 2-4 birds per site. The larger survey area (including Grand Canyon, the Virgin River and southern Nevada) had a total of 117 birds and 66 nests (McKernan and Braden 2001b). Data from the 2001 field season for the larger survey area (including the Grand Canyon and portions of southern Nevada) were presented in the 2002 BA. Approximately 215 breeding birds and 100 nests were documented in the draft report for the 2001 field season (USBR 2002). Additional information summarized from recent reports on cowbird trapping and the 2001 field season are summarized in the 2002 BA.

Conservation efforts in the last 5 years have provided for surveys and monitoring of populations, cowbird control, habitat quality evaluations, habitat protection through acquisition and cooperative management, research into habitat restoration techniques and other benefits to the species. Funding from Reclamation and the LCR-MSCP have contributed significantly to these efforts. These efforts have documented the LCR population more completely and provided new information on habitat use, nest parasitism and predation than was known in 1997.

Yuma clapper rail

Rail populations along the LCR represent approximately half of the total United States population. Rails appear to be expanding their range up into Lake Mead, including Las Vegas Wash and the Virgin River inflow area (McKernan and Braden 2001a). Populations on the LCR below Lake Mead are found in established marsh areas. Some of these marshes may be losing habitat value due to overgrowth of cattail and natural succession toward dry land, becoming less suitable for clapper rails. Management of overgrown marshes using prescribed fire is the subject of ongoing experiments to restore habitat quality. Loss of marshes due to succession continues

in the project area with local efforts (usually involving dredging) setting back succession through deepening and opening up backwaters. Effects due to selenium toxicity from crayfish in their diet are also unknown. Aside from replacement habitat under ISC/SIA, no specific conservation measures or ICMs focused on the clapper rail. Completion of dredging projects in the Imperial Division to open up backwaters, and in the Laughlin Lagoon area will provide for refreshed marsh habitats in those areas for clapper rails.

B. Factors affecting species environment within the action area

For the LCR, the 1996 BA and 1997 BO provided information for an extensive environmental baseline examining historical biological and physical river conditions and the projects that altered those conditions in the past. The discussions in those documents are incorporated herein by reference. The discussion in this document is only a brief summary.

Creation of the large dams provided for large reservoirs to replace riverine and floodplain habitats. Downstream of these dams there were effects to sediment inputs and transport and water temperature. Control of water flows from the large dams to provide for agricultural and municipal/industrial uses and flood control significantly altered the natural river hydrograph and reduced flow variations on a seasonal scale while increasing them on a daily scale. Flood plain protection through levees, channelization by dredging and bank stabilization confined the river channel and eliminated the meandering course through the valleys. Significant changes to species habitats resulted from the direct and indirect (those effects later in time or outside the footprint of an action) effects of these actions. Some of the indirect effects of baseline actions will continue to alter the system into the future until a new equilibrium is reached. Examples of these indirect effects are channel incisement resulting from bank stabilization, prevention of erosive events that provide sediments to the system, and changes in sediment movement and substrate composition below large dams.

Riparian habitats were affected by actions in the environmental baseline in several ways. Creation of the large reservoirs drowned out river valleys that once supported floodplains with cottonwood-willow and mesquite woodlands. Control of flows in the river reduced the potential for seasonal flooding that provided for maintenance, elimination and regeneration of woodlands in a successional cycle. The effects of controlled flows, when combined with levees and stabilized banks that shut off the floodplain and prevented the river from meandering, reduced the opportunity for natural regeneration of the woodlands by preventing moist soil conditions for seedling establishment and growth. Channel incisement worsened the situation for regeneration by dropping the water table under the floodplain woodlands. While adult trees might be able to follow the dropping water table if the change was slow enough, young trees and seedlings could not. Elimination of existing stands of cottonwood-willow and mesquite in the floodplain by wildfire or conversion to agriculture and other human development actions reduced the total acreage of these types in the action area. The inability of the modified river system to provide for regeneration of these woodlands through seedling establishment and succession once they were lost has resulted in the current levels of riparian habitat on the LCR. The current conditions also

encourage the spread of non-native tamarisk (*Tamarix sp.*) in the action area. This expansion has further reduced the acreage available and suitable for native riparian trees. Under the present set of conditions, the remaining acreage of cottonwood-willow habitat will be lost and not replaced by the same vegetation type. The mesquite woodlands face similar issues and continue to be lost.

Marshes and backwaters were formed, maintained and ultimately destroyed by the meandering river. Marshes also developed near the confluences with tributary streams such as the Bill Williams and Gila Rivers as well as along the edges of backwater lakes and river channels. Development of agricultural, recreational, residential and commercial areas in the floodplains has eliminated any backwaters or marshes found there. Those that remain are along the river corridor on undeveloped lands. Marshes and backwaters are transitory habitats in that there is a distinct natural aging process. A backwater can be connected to the river or isolated (as in a cut-off oxbow). Once formed, it begins to fill in with vegetation from adjacent riparian or marshes and sediment transported overland or from the river flows. Depending on the size and initial depth of this backwater and the natural flows over the years, the aging process may be rapid or more prolonged. As the backwater becomes shallower, it becomes more and more marsh-like as cattails and bulrush grow in the shallow water. Eventually, even the shallow water is gone, and the marsh may persist for some years. If the river changes its channel away from the backwater/marsh, it may dry out enough to support riparian vegetation. Under natural fluvial processes, backwaters and marshes are actively created and destroyed by the river as it meanders and passively created or destroyed by the natural aging process if the river does not migrate back to the location. Very large floods would eliminate most or all backwaters or marshes in the floodplain, but there would be creation of new backwaters from the falling waters of the same event. Under the present conditions, the river cannot meander and create new backwaters and marshes; however, the existing backwaters and marshes are more permanent since they are not cyclically created and destroyed. The backwaters that are left are relicts of the past fluvial processes no longer in operation. Flood releases do still occur, but do not create new backwaters. Recent high water in the 1980's and early 1990's actually damaged some backwaters by depositing sediment from the channel into them, decreasing depths and open water area and shortening their life expectancy. Backwaters on the LCR that are not connected to the river are aging out of existence. Declines in the water table from controlled flows and channel incisement decrease the depth of these backwaters and contribute to increasing marsh vegetation around the edges and in other shallow waters. The marshes formed are also aging, with overgrowth of cattails and bullrush to extremely dense mats and spread that eliminates open water. Continuation of any marsh habitat on the site is dependent on the groundwater level (which is controlled by the median annual river stage) and the extent of overgrowth of marsh vegetation. Invasion of drier sites by tamarisk, native riparian trees and shrubs eliminates any residual marsh values. The eventual result of this suppression of natural fluvial processes is the virtual elimination of backwaters and marshes.

The only backwaters and marshes that will remain in the future are those actively maintained in place by Reclamation or other Federal, Tribal, State or private landowners. Reclamation has a mitigation responsibility to maintain a number of backwaters (USBR 1996) resulting from

National Environmental Policy Act (NEPA) and Fish and Wildlife Coordination Act (FWCA) compliance for various channelization, dredging and stabilization activities. Maintenance largely consists of periodic dredging to set back the natural aging process. Thus, a number of backwaters are artificially maintained in the same place they originally formed. Backwaters not covered by mitigation commitments are not maintained unless a multi-agency group can raise the funds to dredge the backwater. The remaining marshes on the LCR are associated with these mitigation areas (especially on National Wildlife Refuges) or are formed because of the ponding effect of the small diversion dams. An example of the former is Topock Marsh on Havasu NWR and the latter are the marshes behind Imperial Dam (on the Imperial NWR). These marshes continue to age naturally through expanding into shallow water and creating more shallow water by laying down vegetation on the bottom of the backwater. Overgrowth of cattails and bullrush chokes any open water and reduces habitat for marsh birds. Active management is needed to maintain these marshes in their current location and in a condition providing suitable habitat for marsh species. Without this effort, these areas will degrade and be lost.

Aquatic habitats in the LCR have been simplified by the changed flows and channelization of the river. The main channel of the LCR is managed to deliver water efficiently, not to provide a varied habitat for fish. Backwaters, eddies, side channels and other features of a meandering river system are lost as the channel is constricted and incised and the natural hydrograph is eliminated. Nutrient inputs from marshes and riparian areas flooded by spring and summer high flows are lost, as are the shallow waters needed as nursery areas for fish. Eddies, gravel and cobble bars, side channels and braided channels do not provide for efficient delivery of water and have been eliminated or significantly reduced. For example, dredging of wash fans, a significant source of sands, gravels and cobble to the system, reduces this input and further homogenizes the channel. Controlled flows alter water depths and velocities on a daily basis, the effects greatest below the large dams and attenuated downstream. Depending on local water depths, this variation may be enough to dry up connected backwaters and expose spawning or shallow nursery habitats. The conditions in the main channel of the LCR have not improved over the past five years and conditions will continue to decline as indirect effects of baseline actions continue to occur.

The physical and biological conditions of the environmental baseline have also been affected by river management and operations since 1997. The remainder of this discussion will update the baseline to January 2002 by reviewing Federal, State and private actions that have occurred in the 1997-2001 period.

Section 7 consultations and concurrences for a variety of Federal actions have been completed. The most important of these was the January 12, 2001 BO for the Interim Surplus Criteria for Lake Mead and the Secretarial Implementation Agreements for the California 4.4 Plan (ISC/SIA). An extensive program of conservation measures was included with the ISC/SIA. The 2001 BO for this project is incorporated by reference (USFWS 2001a) and detailed information will not be provided here. Briefly, implementation of the ISC for 15 years would have effects to Lake Mead water levels and frequency of flood flows. Effects to the Lake Mead

razorback sucker population are addressed by provisions regarding the lake levels covered by the consultation and continued research into the population. Implementation of the SIA for up to 75 years would affect flows in the river between Parker Dam and Imperial Dam. Losses to riparian, marsh and backwater habitats from SIA implementation are eliminated through the conservation measures. Losses to razorback sucker habitat is addressed through stocking an additional 20,000 sub-adults below Parker Dam. The environmental baseline in the 2001 BO included information on changes to the baseline since 1997 and is incorporated herein by reference.

Other Reclamation projects completed since 1997 are detailed in the 2002 BA and are incorporated by reference. Briefly, these include dredging projects (RM 31, RM 33, the Morelos Dam flood channel, the Arizona Channel in the Imperial Division, Walter's Camp lagoon, Three Finger Lake, maintenance work above Imperial Dam, and Laughlin Lagoon), levee and bank stabilization maintenance, new bank stabilization (Palo Verde Dam) and other maintenance under the Colorado River Front Work and Levee System (CRFWLS). Some of these projects were undertaken for conservation purposes (to restore and enhance backwaters and marshes), while others were for system operation and channel maintenance.

The Corps of Engineers issued a number of permits under section 404 of the Clean Water Act. These mostly addressed new or improvements to boat docks, launch ramps and maintenance dredging of recreational facilities access. Areas most affected by these permits tend to be in developed (residential/commercial/recreational) areas of the river. Permits under programs involving the Environmental Protection Agency for effluent discharges (NPDES program) have also been issued.

Fish and wildlife management activities by Bureau of Land Management (BLM), National Park Service (NPS), the Service, and conservation actions funded by Reclamation as part of cooperative efforts were also accomplished during the 1997-2002 period. Reclamation's contributions to these programs are included in the 2002 BA and are incorporated here by reference. Some of these projects also involved Tribal and State partners and provided improved riparian, marsh and backwater habitats for all fish and wildlife species. Some trout and catfish stocking was also done by the Service under the 1994 BO (USFWS 1994).

The LCR-MSCP also contributed to endangered species conservation through the ICM program. Funding was provided for a variety of species to augment ongoing programs or obtain needed data on certain species groups. A list of the ICM projects and their status is in Table 3 (Meisler 2000a, 2000b).

Reclamation's water and power operations have also continued over the 1997-2002 time period. Some of these actions are discretionary and were the subject of the 1997 consultation, others are non-discretionary (including State and Mexico scheduled water deliveries). The 2002 BA provides details on water deliveries and other related issues over the period and is incorporated herein by reference.

State, Tribal and private discretionary activities have also continued to occur in the 1997-2001 time period. These activities include scheduling, diversion and return flows of contracted Colorado River water, planning and zoning activities including approval of construction permits for riverside or floodplain lands. Fish and wildlife activities by State agencies focused on management of sport fisheries in the river and included surveys, stockings (often in conjunction with the Service) of trout in limited areas, and placement of fish habitat enhancement materials (citrus trees, conifer tree bundles).

SUMMARY

The environmental baseline in April 2002 is a result of implementation over time of projects and actions by Federal, State and private parties. These past actions have shaped the physical and biological conditions in the river, and also continue to have indirect effects that are expressed over time as the system attempts to move to a new equilibrium within the range of fluvial processes remaining. These indirect effects include additional channel incisement, sediment transport, substrate changes, as well as the continued aging of backwaters and marshes, lack of opportunity for riparian regeneration, and many others described or referenced earlier. The end result of the past actions is a continuing downward trend of riparian, marsh, and aquatic habitat diversity and quality in the LCR.

Many of the Federal, State and private actions that were implemented prior to 1997 were implemented in the same way between 1997 and 2002. Defining any new effects from this implementation is extremely difficult owing to the physical and biological conditions created by past implementation of those actions. Implementation of these actions in 1997-2002 did not reduce or eliminate the degree of suppression of natural fluvial processes seen in the 1997 baseline. This suppression continues at the same level as a result of implementation of these unchanged, yet re-occurring actions. Thus the degraded ecological conditions of the LCR encompassed in the baseline continue through to the present.

Since 1997, additional effects that have impacted baseline conditions have resulted from the new Federal, State and private actions implemented on the river. These include sediment removal, channel incisement with effects to nearby riparian, marsh and backwater communities, new bank stabilization that reduces sediment inflow and affects flow velocities within the channel, elimination of additional river bank and floodplain habitat to residential/commercial/recreational development that also affects future flood release options and water use, new water contracts and changes in points of diversion for up to 400,000 acre-feet of water under the SIA. These new effects are additive to the environmental baseline of 1997 and are included in the 2002 baseline.

The end result of this evaluation of the environmental baseline shows an improvement in the biological status within the action area for the bonytail chub, razorback sucker, and southwestern willow flycatcher. The greater numbers of fish stocked into the system since 1997 have reduced the short-term risk of extirpation or extinction of these species from the wild. Research and monitoring have provided information on habitat use and recruitment. Long term provisions for

recovery of these fish with self-sustaining populations have not yet been accomplished, but maintaining the species through stocking provides the time to address issues of habitat and non-native species that are maintained in the action area. For the southwestern willow flycatcher, identification of occupied habitat provides opportunities to protect those areas, acquisition can protect occupied and suitable habitats, and research into habitat use, predators and parasitism will guide future management. Techniques being examined for successful regeneration of riparian habitats will be critical to the survival and recovery for the species. While significant improvements in biological status for the Yuma clapper rail have not been documented, we do not believe its status has declined since 1997. On a local habitat scale, there have been improvements to some marshes and backwaters through active management (dredging) and replacement of affected habitats; however, these gains may be offset by losses due to natural aging processes elsewhere in the system.

In terms of physical habitat, the downward trend for species habitats seen in the 1997 environmental baseline continues to 2002 owing to the indirect effects of past actions and continued suppression and restriction of natural fluvial processes. Riparian vegetation regeneration is precluded while marsh and backwaters continue to undergo successional changes toward terrestrial vegetation communities with the resultant incremental losses of habitat value. Riverine habitats become more homogenized under channelization and habitat diversity decreases with isolation from the floodplain due in part to channel incisement and controlled flows while important backwaters age out of existence and are not replaced. Actions since 1997 are largely the same actions that created the 1997 baseline conditions, and continuation of those actions in the 1997-2002 period did not allow for any restoration of natural fluvial conditions that control regeneration and restoration of these natural habitats.

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

The proposed action is the implementation of Reclamation's discretionary operations and maintenance activities as described in the 1996 BA and 2002 BA and the implementation of conservation measures described in the 2002 BA. Discretionary operational and maintenance activities have had past effects that are counted in the environmental baseline, however, their effects to the river environment over the April 30, 2002 to April 30, 2005 period covered by this consultation are effects of the action. These effects are felt both by the populations of the listed

species and the constituent elements of critical habitat. The 1997 BO contained an extended discussion of the effects of the action on listed species, and that discussion is incorporated herein by reference.

It is not expected that any new types of effects to the river environments would result from the implementation of Reclamation's discretionary activities through April 30, 2005. Based on information provided in the 2002 BA on effects resulting from these same activities in the 1997-2002 period, implementation of these activities is not likely to result in large changes to the existing physical and biological river conditions from those in the environmental baseline over the three year period. As noted in the discussion updating the environmental baseline for 1997-2002, the effect of implementing Reclamation's discretionary activities from 2002-2005 includes the continuation of physical and biological conditions described in the baseline.

There are no new activities proposed in the 2002 BA, but additional maintenance activities under the CRFWLS would occur over the three year period. The amount of this work is difficult to predict, therefore quantifying a level of new effect is not possible. The 2002 BA contained information on the extent of such activities between 1997 and 2001. This data may not be transferable to the future, but is useful to gain a picture of the types and amounts of these tasks that usually occur. Work over the next three years is likely to include maintaining stabilized banks and levees, and maintenance dredging. Additional areas needing rip-rap bank stabilization because of new erosion or failure of existing stabilization may also be identified, potentially increasing the total bank stabilization along the river. Effects of these types of activities have been discussed in the environmental baseline of the 1997 BO. Briefly, additional bank stabilization leads to changes to channel configuration, especially in terms of channel incisement, that will affect main channel aquatic habitats as well as backwaters and marshes that experience reduced water levels. Deepening channels through incisement also has an adverse effect on groundwater under the riparian habitats and adds additional environmental stress to existing vegetation communities. Overbank flooding potential, already limited by existing flow regimes and channel incisement, is further reduced. Stabilized banks also do not erode, reducing sediment inflow to this sediment poor system. Dredging also removes sediments in local areas, providing deeper water and changing flow dynamics. Sediments dredged and placed on upland sites are largely lost to downstream reaches. As with similar activities implemented in the past, channel maintenance actions have long-term indirect effects. These are the same as described earlier in this document.

For the bonytail chub and razorback sucker, physical and biological habitats as described in the baseline will not significantly decline over 2002 levels as a result of Reclamation's proposed action. This is because of the limited number of new river maintenance actions likely to occur (as based on the record of such actions for 1997-2001) in the three year period and the lack of any new discretionary actions implemented by Reclamation that would have additional effects on these habitats. There would not be any improvement over baseline conditions because the effect of Reclamation's discretionary actions is to maintain the facilities that created the baseline conditions. Implementation of the conservation measures will continue to improve the population status of the razorback sucker in the action area through augmentation of young adults

to the populations, monitoring of habitat use by stocked fish and examination of the effects of non-native fish. Establishment of the isolated habitats provides opportunities for a naturally recruiting population to be established in a managed situation. For bonytail chub, the conservation measures focus on supporting future introductions and provision of isolated populations with natural recruitment. These efforts address the short-term risk of extirpation, loss of genetic variance and possible extinction from the wild and are extremely valuable.

For the southwestern willow flycatcher, the physical and biological habitats as described in the baseline will not significantly decline over 2002 levels as a result of Reclamation's proposed action. The lack of natural riparian regeneration opportunity and continued loss of that habitat over time will not change since implementation of the proposed action will maintain the conditions that exist. There are, through the conservation measures, effects that improve the status of the species in the action area. This is because of the efforts made to survey and document nesting territories, define habitat parameters, protect existing habitats from fire and other human disturbance and the continued efforts to artificially restore native riparian habitats that can no longer regenerate due to the existing baseline. Recent results of surveys indicate some expansion of the flycatcher population within the action area (USBR 2002); however, this data is still preliminary and conditions responsible for any increase are not defined. Continuation of these conservation activities will address questions needed for future survival and recovery.

For the Yuma clapper rail, the physical and biological habitats as described in the baseline will not significantly decline over 2002 levels as a result of Reclamation's proposed actions. Restoration and enhancement projects for existing degraded marshes will result in improvements to those habitats. The actual dredging or burning of the marshes does eliminate habitat under the short term and rails may be displaced from these habitats. The overall population of rails in the action area is not likely to be diminished by actions in the 2002-2005 period.

Outside of the CRFWLS activities discussed above, the remainder of Reclamation's discretionary actions are unchanged from those actions now included in the environmental baseline. New effects from implementing these actions in the 2002-2005 time period are very difficult to separate from the conditions in the baseline and the downward trend of the habitats due to indirect effects of past actions. The effects of implementing these actions is best described in terms of management that maintains the existing physical and biological conditions inherent in the baseline. Suppression of natural fluvial processes will be continued for the next three years under the proposed action.

Critical habitat for the bonytail chub and razorback sucker is included in the action area and will be affected by the proposed action. Constituent elements for water, physical and biological habitat are affected by river operations and maintenance that supports the existing degraded conditions. While the existing water and physical habitat parameters can support populations of the bonytail chub and razorback sucker, the potential to improve habitat quality through changes in river management are precluded by continuation of the existing management. The current

conditions also favor non-native fish species that are better adapted to the homogenized conditions. The native fish species are poor competitors with these introduced species under the current management direction.

Interrelated or Interdependent Actions

No interrelated or interdependent actions were identified in this consultation.

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 ESA.

In the 1997 BO, cumulative effects were broken out into several categories; effects of human population growth, economic development, visitation/recreation, environmental contaminants, wildfires (for clapper rail and southwestern willow flycatcher), and non-native fish stocking (for bonytail chub and razorback sucker). Activities and their effects were discussed in the BO text. An update on the cumulative effects of actions within the LCR area was also done in the 2001 BO for ISC/SIA (USFWS 2001b). Both discussions are incorporated here by reference.

As noted in the environmental baseline, State discretionary activities involving water diversion for agricultural and municipal uses are an integral part of the overall management of the LCR. These activities will continue through the period covered by this BO. These river flows will maintain the current hydrograph at the expense of the natural hydrograph and maintains the degraded conditions that exist in the baseline over the period covered by this consultation.

CONCLUSION

The 1997 BO on Reclamation's discretionary operations and maintenance activities found there was jeopardy for the bonytail chub, razorback sucker, southwestern willow flycatcher and adverse modification of designated critical habitat for the two fish species. No jeopardy was found to the Yuma clapper rail. After reviewing the current status of the bonytail chub, razorback sucker, southwestern willow flycatcher and Yuma clapper rail, the environmental baseline for the action area, the effects of the proposed action including the effects of conservation measures, and cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the bonytail chub, razorback sucker, southwestern willow flycatcher or Yuma clapper rail or result in the destruction or adverse modification of designated critical habitat for the two fish species. The Service has made this finding based on the best available scientific information and the following considerations:

1. The environmental baseline of physical and biological habitat for the four listed species has been significantly degraded by past activities. Natural river processes were and are repressed

and precluded from operating normally in the LCR. This situation would continue for another three years. Significant new adverse effects from continuing the operations and maintenance are not likely to occur over the three years covered by the consultation.

2. Past implementation of conservation activities and RPA requirements have provided benefits to the listed species and their habitats and improved their status within the action area sufficiently to address effects of the proposed action over the three-year period.

The conclusions of this BO are based on the full implementation of the project as described in the Description of the Proposed Action section of this document, including all conservation measures identified in the 2002 BA. Failure to implement the project as proposed, including any conservation measures, or implementation of the project in a manner that causes and effect to listed species or designated critical habitat not adequately considered in this BO may cause coverage under the incidental take statement of this BO to lapse and may require reinitiation of consultation to ensure compliance with section 7(a)(2) of the ESA.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA 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 Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral pattern, including breeding, feeding and sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA 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 Reclamation 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. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to assume and implement the terms and conditions or (2) fails to require the applicants 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, Reclamation and/or the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

The 1997 BO and 2001 BO contain extensive information on the potential types of incidental take and how habitat and take of individuals is related. That information is incorporated herein by reference. The following text provides a brief discussion of the types of take.

Bonytail chub

The Service anticipates that take of bonytail chub will occur as a result of the proposed action. The incidental take is expected to be in the form of harming, harassing and killing individuals of the species. Take will occur in Lake Mohave, Lake Havasu and the river reach between them. Entrainment into canals, pumping plants, and electrical generating facilities will injure or kill individuals. Changes in water surface levels will expose shallow spawning or nursery areas, drain backwaters or trap fish in side pools where they could die. Incidental take of the bonytail chub will be difficult to detect for the following reasons:

- Detection of fish that have been entrained into canals or pipelines is difficult. Those that pass through pumping plants or electrical turbines may never be observed.
- Use of habitats near potential entrainment sites is not well known due to the small size of the populations. Further, because most fish are sub-adults, their adult behavior patterns may not be set and habitat use may change.
- Documented locations for bonytail breeding and nursery areas are not available due to the lack of a breeding population. As sub-adult fish reach maturity, breeding sites can be identified and risks of stranding assessed.

In the 1997 BO, take levels for the entrainment in canals of the bonytail chub was linked with take for the razorback sucker. The incidental take was defined as two bonytail chubs or razorback suckers (or any combination thereof) during the first two years (1997-1998) and two bonytail or razorback (or any combination thereof) plus one additional individual of the appropriate species per 1,000 individuals of that species stocked into the LCR under any stocking or augmentation program. With the 31,326 bonytail chub stocked into the LCR since 1997 (Table 2), the level of take is now 33 bonytail chub. This formula will be extended for the three-year extension. Fish that are found alive in the canals and released do not count toward the take.

Specific take levels were not set for stranding and entrainment in powerplants or pipelines in the 1997 incidental take statement. For this 2002 incidental take statement, the level of take from these events is covered by the 33 bonytail chub discussed above. The increase in bonytail chub population in the action area, and the degree of risk for stranding, entrainment in canals, pipelines and diversions is similar. Fish found alive in canals, irrigation or water delivery systems, or below dams where they were originally stocked do not count toward the take.

Razorback sucker

The Service anticipates that take of razorback sucker will occur as a result of the proposed action. The incidental take is expected to be in the form of harming, harassing and killing individuals of

the species. Take will occur in the LCR between Lake Mead and Imperial Dam. Entrainment into canals, pumping plants, and electrical generating facilities will injure or kill individuals. Some individuals may survive, as implied by the recovery of a living razorback sucker from the river below Lake Mohave that had been originally stocked into Lake Mohave. Another stocked razorback sucker was found alive in the Palo Verde Irrigation District canal in 2001. Changes in water surface levels will expose shallow spawning or nursery areas, drain backwaters or trap fish in side pools where they could die. Incidental take of the razorback sucker will be difficult to detect for the following reasons:

- Detection of fish that have been entrained into canals or pipelines is difficult. Those that pass through pumping plants or electrical turbines may never be found.
- Use of habitats near all potential areas of entrainment is not fully known due to the small size of the populations in most river reaches. Further, because most fish are sub-adults, their adult behavior patterns may not be set and habitat use may change.
- The location of some breeding and nursery areas in Lake Mead and Lake Mohave are known, but areas in the rest of the river and Lake Havasu are not known. As the sub-adult fish reach maturity, breeding sites can be identified and risks of stranding assessed.

In the 1997 BO, take levels for the entrainment in canals of the razorback sucker was linked with take for the bonytail chub. The incidental take was defined as two bonytail chubs or razorback suckers (or any combination thereof) during the first two years (1997-1998) and two bonytail or razorback (or any combination thereof) plus one additional individual of the appropriate species per 1,000 individuals of that species stocked into the LCR under any stocking or augmentation program for the 1999-2002 period. With the 86,950 razorback suckers stocked into the LCR since 1997 (Table 2), the level of take is now 89 razorback suckers. This formula will be extended for the three-year extension. Fish that are found alive in canals and released do not count toward the take.

Specific take levels were not set for stranding and entrainment in powerplants or pipelines in the 1997 incidental take statement. For this 2002 incidental take statement, the level of take from these events is covered by the 89 razorback suckers discussed above. The increase in razorback sucker populations in the action area, and the degree of risk for stranding, entrainment in canals, pipelines and diversions is similar. Fish found alive in canals, irrigation or water delivery systems, or below dams where they were originally stocked do not count toward the take.

Southwestern willow flycatcher

The Service has determined that the only potential for incidental take of the flycatcher is through harassment. Maintenance of CRFWLS facilities and enhancement projects for riparian, marsh and backwater habitats along the LCR are part of the proposed action. Riparian habitat known to be used by flycatchers for breeding and migration are in the vicinity of these actions (McKernan and Braden 2001b). It is assumed that actual removal of flycatcher habitat would not be part of any proposed action covered under this consultation. Projects where removal of suitable

flycatcher habitat is proposed would require additional consultation. Because it is not reasonably certain that harassment would occur, the Service is not providing any incidental take for the flycatcher in this consultation. Our justification for this is as follows.

Both maintenance and enhancement activities proposed by Reclamation involve use of dredges, excavators, bulldozers and other heavy equipment that can create significant amounts of noise. If these activities are undertaken near breeding habitat during the breeding season, this harassment may lead to nest abandonment. Distance to the nest and the amount of noise generated would be important factors in determining if an effect would take place. Based on data from surveys in 2000 (McKernan and Braden 2001b), breeding habitat exists in the Mohave Valley, Parker, Palo Verde and Imperial divisions. The probability of work under either maintenance or enhancement programs occurring in these areas over the 2002-2005 period is uncertain. Reclamation can avoid incidental take from harassment resulting from any project that does occur by assessing the degree of risk to an active nest from the activity and scheduling work accordingly.

Migratory habitat is less well defined, with flycatchers using a variety of riparian areas on their seasonal journeys and during dispersal of young birds from the nest. Again, noise and the human activity related to the projects is a potential source of harassment. The uncertainty of this harassment occurring is even greater than that for breeding habitat because of the transitory use of the habitats involved. Scheduling work to avoid areas known to be used by migrating or dispersing flycatchers could be considered by Reclamation.

Yuma clapper rail

The Service anticipates that take of Yuma clapper rail will occur as a result of the proposed action. The incidental take will be in the form of harm and harassment to individuals. Take would occur from disturbances to rail habitats during the breeding/nesting season, and the removal of cattail areas during river maintenance activities. Incidental take of nests and young birds will be difficult to estimate or detect because the clapper rail is a secretive nest builder and nests are extremely hard to locate. While adult clapper rails can be detected using tape call-back surveys, these are effective only during the breeding season and not all rails respond to the calls. In the 1997 BO, a surrogate measure for incidental take was not used and implementation of the RPMs and T&Cs was assumed to adequately avoid or minimize the level of take. The same approach has been used for this BO.

Migratory birds

The Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

EFFECT OF THE TAKE

In the accompanying BO, the Service 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

Bonytail chub and razorback sucker

The incidental take statement that accompanied the 1997 BO contained three RPMs designed to minimize take of these species from stranding, dams, and entrainment. Over the past five years, Reclamation has met the requirements of these RPMs to assess the risks to the species from these sources of take and provide documentation to the Service of measures deemed necessary to reduce the take. A new RPM been identified for the bonytail chub and razorback sucker for the 2002-2005 period covered by this consultation.

The following RPM is necessary and appropriate to minimize take of bonytail chub and razorback sucker:

1. Reclamation shall monitor incidental take resulting from the proposed action and report to the Service the findings of that monitoring.

Yuma clapper rail

The incidental take statement that accompanied the 1997 BO contained two RPMs designed to minimize take of the species from habitat loss and degradation, other disturbances related to operations and maintenance activities. Those RPMs are continued for the 2002-2005 period.

The following RPMs are necessary and appropriate to minimize take of Yuma clapper rail:

1. Operations and maintenance actions taken by Reclamation must result in no net loss of Yuma clapper rail habitat, otherwise rails will be taken due to loss of nesting habitat. Disturbance of rails and rail habitat must be minimized. If areas are affected, they must be restored or replaced.
2. Subject to the limitations of RPA 2 and 6 from the 1997 BO for bonytail chub, razorback sucker, and southwestern willow flycatcher (which take precedence over this provision), dredging to maintain wetland and backwaters to offset succession and to benefit clapper rails must be continued as part of Reclamation's annual maintenance program on the Colorado River.

TERMS AND CONDITIONS

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

Bonytail chub and razorback sucker

The following terms and conditions implement RPM 1 for these species:

- 1.1. Reclamation will, with the cooperation of water users and dam operators on the LCR, document all records of bonytail chub and razorback sucker that are found in irrigation systems or other diversions, or pass through LCR dams or powerplants.

Yuma clapper rail

The following terms and conditions implement RPM 1 for this species:

- 1.1. All clapper rail habitat areas destroyed or degraded due to future project activities shall be restored by the action agency.
- 1.2. This restoration shall be implemented as part of the scheduled project activity and completed within one year of the action.
- 1.3. Where there is discretion regarding the scheduling of activities (such as non-emergency work or activities that are not constrained seasonally) in or near rail habitat, the clapper rail nesting season (March 15-July 10) will be avoided.

The following terms and conditions implement RPM 2 for this species:

- 2.1. Reclamation will continue to maintain all mitigation backwaters and will work with all resource agencies on a cost-share basis to maintain other backwaters. These backwaters will contain areas suitable for Yuma clapper rail habitat.

Review Requirements

The RPMs, with their implementing T&Cs, 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 RPMs provided. Reclamation must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the RPMs.

Reporting Requirements

Reclamation will provide the Service with annual reports on the implementation of RPMs and T&Cs. These reports will be due to the Service on the same schedule as followed to date for the 1997 BO.

Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the Service's Division of Law Enforcement, Federal Building, Room 8, 26 North McDonald, Mesa, Arizona 85201 (480/835-8289) 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 ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered or 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. The Service has developed the following conservation recommendations for this consultation:

1. We recommend that Reclamation take the lead to work with the Service and other appropriate agencies and individuals to define "potential habitat" for southwestern willow flycatchers on the LCR. The existing use of the term includes a variety of on-the-ground conditions ranging from vegetation communities developing toward suitability, those that could be managed to reach suitability, and those that are actually unsuitable. Resolution of this issue would contribute to effects analyses for future projects, assist in locating mitigation and enhancement areas, and contribute to the recovery of the flycatcher.
2. We recommend that Reclamation facilitate the coordination of existing native fish (bonytail chub and razorback sucker) programs on the LCR. There are several ongoing programs, most of which have a connection to Reclamation, that have successfully augmented the wild populations of these fish in the river. These programs are at the stage of completion where the next steps to maintain or enhance the accrued benefits need to be defined so they can be built into budget requests for recovery actions or form part of conservation measures for future conditions. This facilitation could be done in conjunction with ongoing Service efforts to address the native fish issues of the LCR.

3. In the 1997 BO, there were several T&Cs that addressed protection of flycatcher habitat. These T&Cs looked at cowbird trapping (now a conservation measure under this BO) and additional status surveys (to supplement RPM 8) that remain within the proposed action. The T&Cs from 1997 that are not included in this BO address fire risks (agreements for fire breaks, public closures, a public information program, and a yearly report of fire activity). The Service recommends that Reclamation continue to implement effective and practicable fire avoidance activities and documentation efforts for the next three years.

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

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the reinitiation request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (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 BO; (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 BO; 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. Because this BO only covers Reclamation's discretionary activities for three years, reinitiation of consultation will be required if the LCR MSCP is not completed by April 30, 2005.

The Service appreciates the cooperation and significant efforts shown by Reclamation to identify and minimize effects to listed species from this proposed action. For further information please contact Lesley Fitzpatrick (x236) or Tom Gatz (x240). Please refer to consultation number 2-21-95-F-216R in future correspondence concerning this project.

/s/ David L. Harlow

cc: Director, Fish and Wildlife Service, Arlington, VA (AES)
Regional Director, Southwest Regional Office, Fish and Wildlife Service, Albuquerque, NM (AES)
Field Supervisor, Ventura Field Office, Fish and Wildlife Service, Ventura, CA
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Sam Spiller, Lower Colorado River Coordinator, Fish and Wildlife Service, Phoenix, AZ

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Chairman, Chemehuevi Tribe, Havasu Lake, CA

Chairperson, Fort Mohave Indian Tribe, Needles, CA

Chairman, Colorado River Indian Tribes, Parker, AZ

Chairperson, Cocopah Tribe, Yuma, AZ

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Governor, Pueblo of Zuni, Zuni, NM

Gerald Zimmerman, Chairman, LCR-MSCP, Colorado River Board of California, Glendale, CA

John Kennedy, Arizona Game and Fish Department, Phoenix, AZ

Director, California Department of Fish and Game, Sacramento, CA

Director, Nevada Division of Wildlife, Carson City, NV

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Tables Cited in Text

Table 1: Yuma clapper rail survey data 1997-2001

Year	Rails on LCR	Other US Rails	Total Rails Counted in US
1997	384	332	716
1998	272	281	553
1999	315	292	607
2000	218	246	464
2001	220	309	529

Note:

Numbers of rails represents the minimum number of rails found in the survey areas. Survey methods are not designed to estimate a total rail population. All surveys in the US use the same survey protocol for rails so data is comparable between the LCR and other US locations.

Table 2: Bonytail chub and razorback sucker stockings into LCR waters, 1997-2001

Species	Lake Mead	Lake Mohave	Lake Havasu	below Parker Dam	TOTAL
Bonytail chub	--	26,826	~ 4,500	--	31,326
Razorback sucker	67	48,745	~ 29,000	9,138	86,950

Table 3: LCR-MSCP Interim Conservation Measures 1997 to 2000

DATE	NAME OF PROJECT	FUNDING	STATUS
1997	Achii Hanyo Renovation	\$50,000*	Complete
1997	AGFD Razorback Sucker Work on LCR	\$20,000*	Complete
1997	NDOW Razorback Sucker Work on LCR	\$30,000*	Complete
1997	Lake Mohave Native Fish Work Group Larval Collection and Rearing to Stocking Size	\$100,000*	Complete
1998	Lake Mohave Native Fish Work Group Larval Collection and Rearing the Stocking Size	\$100,000*	Complete
1998	Deer Island Project, Colorado River Tribe	\$100,000#	Complete
1999	Lake Mohave Native Fish Work Group Larval Collection and Rearing to Stocking Size	\$100,000#	Complete
1999	“Bring Back the Natives” Matching Funds Projects: 1. Bill Williams River NWR Riparian (part completed) 2. Havasu NWR Riparian (not begun on ground work) 3. Cowbird Trapping (withdrawn) 4. Achii Hanyo operations (complete) 5. Relict leopard frog refuge (not begun on ground work) 6. Fort Mohave Tribe Twin Lakes (withdrawn)	\$187,569 # (funds for withdrawn projects went to other ICM projects)	Partially Complete
2000	Using forage fish to accelerate bonytail growth	\$15,000#	Ongoing
2000	Lake Mohave razorback repatriation	\$31,000#	Ongoing
2000	Pintail Slough Project with Ducks Unlimited on Havasu NWR	\$49,250#	Ongoing
2000	Gila River Tribal Hatchery Bonytail Rearing	\$21,000#	Ongoing
2000	LCR Bat Species Inventory	\$39,000#	Ongoing
2000	Colorado River Tribe Riparian Restoration	\$47,750#	Ongoing
2000	Bonytail Broodstock Capture Program, Lake Mohave	\$22,000#	Ongoing

* Represents Federal Funds provided by Service and Reclamation

Represents funds provided by non-Federal LCR-MSCP partners