

5-YEAR REVIEW

Species reviewed: Yuma clapper rail / *Rallus longirostris yumanensis*

Date completed: May 30, 2006

Period covered by review: 2000-2005

METHODOLOGY USED TO COMPLETE THIS 5-YEAR REVIEW

The U.S. Fish and Wildlife Service (FWS) conducts status reviews of species on the List of Endangered and Threatened Wildlife and Plants (50 CFR 17.12) as required by section 4(c)(2)(A) of the Endangered Species Act (Act) (16 U.S.C. 1531 *et seq.*). The FWS provided notice of this status review via the Federal Register (FR) and e-mail contacts with knowledgeable individuals and agencies requesting information on the status of the Yuma clapper rail, *Rallus longirostris yumanensis*, (herein after referred to as the clapper rail). We received three responses to the FR notice (Appendix A). One from a member of the public provided no new information and recommended the species be retained as endangered. The other two, one from Bureau of Land Management (BLM) in St. George, Utah, and the other from Arizona Game and Fish Department (AGFD), provided summaries of existing information. No significant new information was obtained through the responses.

This review was prepared by Lesley Fitzpatrick, Fish and Wildlife Biologist in the FWS Arizona Ecological Services Office (ASEO) (602/242-0210 x236) and reviewed by scientific staff at the FWS Region 2 Regional Office, several cooperating FWS offices, Dr. Courtney Conway of the U.S. Geological Survey, Cooperative Fish and Wildlife Research Unit at the University of Arizona, the AGFD, and the California Department of Fish and Game. Comments were received from those entities outside of the FWS Regional Office in the list provided on page 2 of this document that are marked with an asterisk (*). A list of commenters is also included as Appendix B. Responses to the FR notice and comments on the draft review are on file in the ASEO.

In addition to information provided by individuals and agencies to the FR notice, we examined our files for recent survey information, research results, habitat management, and conservation actions not reflected in the most recent recovery report to Congress. These documents are cited herein and copies are maintained at the ASEO.

Limited new biological information was obtained for the review; therefore the decision process focuses mostly on the conservation status of the clapper rail in 2005 in reaching the recommendations contained herein.

GENERAL INFORMATION

FR Notice announcing initiation of this review: 70 FR 5460-5463

Lead Region: Region 2, Southwest Regional Office (RO): Bryan Arroyo, Assistant Regional Director for Ecological Services (505/248-6920)

Lead Field Office: Arizona Ecological Services Office (AESO): Steve Spangle, Field Supervisor (602/242-0210 x244)

Name of Reviewer(s):	FWS RO:	Wendy Brown	(505/248-6664)
		Steve Chambers	(505/248-6658)
		Tracy Melbihess	(505/248-6665)
		Dr. Courtney Conway	(520/626-8535)
		Bill Van Pelt, AGFD*	(602/789-3573)
		Dr. John Gustafson, CDFG*	(916/653-4875)

Cooperating Field Office(s):

Region 2:

Havasu National Wildlife Refuge*
 Bill Williams River National Wildlife Refuge
 Cibola National Wildlife Refuge
 Imperial National Wildlife Refuge*

Region 1:

Carlsbad Fish and Wildlife Office*
 Sonny Bono Salton Sea National Wildlife Refuge*

Cooperating Region(s): Region 1: California-Nevada Operations Office

BACKGROUND

Existing Recovery Plan or Outline: Yuma Clapper Rail Recovery Plan 1983.

Species Existing Recovery Priority Number: 6

Recovery Priority is a FWS ranking system published in the Federal Register on September 21, 1983 (48 FR 43098-43105). The system is based on the degree of threat to the listed entity, the potential for recovery, and the taxonomic status of the listed entity. Priority numbers range from 1 to 18 based on determinations of “high,” “medium,” or “low” for these factors. For the clapper rail, the recovery priority number was determined by considering the high degree of threat from loss of habitat due to lack of natural river processes creating and maintaining marshes, lack of security relative to the protection of existing habitat, a low chance of recovery because of habitat losses in the

United States, the lack of protection for the clapper rail's habitat in Mexico, and that this is a subspecies.

Listing History

Original Listing: Endangered subspecies (32 FR 4001, 11 March 1967). The clapper rail listing covered only those populations that occur in the United States and not those in Mexico. The historical basis of this originated when the clapper rail was listed under the Endangered Species Preservation Act of 1966, which only recognized United States species. The clapper rail appeared on the list under that Act in 1967. Foreign species were not listed until after passage of the Endangered Species Conservation Act of 1969. The first list of foreign species under the 1969 Act did not include the clapper rail, so it was not considered to be listed in Mexico when the United States and foreign lists were combined after the Endangered Species Act of 1973.

Revised Listing: There have been no revisions to the listing. A downlisting package was prepared for the Federal Register in 1983; however, flooding of important clapper rail habitat on the lower Colorado River (LCR) in that year resulted in the proposal not being published. Instability of population numbers after 1983 precluded reconsideration of the proposal.

Associated Actions: There were no associated actions completed. A draft of critical habitat was developed in the early 1980s but was never formally proposed or finalized.

Review History: Previous reviews have not been conducted. Status of the clapper rail has been summarized for biological opinions and habitat conservation planning activities, but these do not constitute a formal status review under section 4(c)(2)(A) of the Act.

Most recent Species Status as reported in the Biennial Recovery Report to Congress:

Species Status: S (Stable)

The species status is considered stable based on the 1998-2002 survey data that showed clapper rail numbers remaining in the range of 500-600 birds. Although the 1998-2002 numbers appear to show a decrease from the 1994-1997 survey data, the decrease may reflect a change in survey effort rather than an actual decrease in birds. Specifically, a reduction in survey effort in the Imperial Division and lack of surveys from the Laguna Division in 1998-99 may be a factor in the reduction in numbers beginning in 1998. The numbers of clapper rails detected on the survey routes increased again in 2003, after the reporting period for this report to Congress (see Appendix C for survey information).

Recovery Achieved: 3

Approximately 75% of the recovery plan tasks have been completed, many of which were addressed in a single life history study (Eddleman 1989). Others are subsumed into related tasks: for example, protection of wintering habitat is now part of protection of breeding habitat in the LCR populations, as these birds are likely non-migratory. Several

important tasks relating to habitat management have not been completed, and new threats have emerged since the recovery plan was completed in 1983. For example, establishment of required flows to maintain habitat has not yet been accomplished, but may be needed as a mechanism to address selenium accumulation in marshes rather than ensure habitat creation, as was conceived when the recovery plan was written.

Reference Point Documents:

Biological Opinion for the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) (USFWS 2005)

LCR MSCP Habitat Conservation Plan (LCR MSCP 2004)

Biological Opinion for Bureau of Reclamation Voluntary Fish and Wildlife Conservation Measures and Associated Conservation Agreements (USFWS 2002)

Eddleman, W.R. 1989. Biology of the Yuma Clapper Rail in the Southwestern U.S. and Northwestern Mexico. Report to U.S. Fish and Wildlife Service and Bureau of Reclamation. Wyoming Cooperative Research Unit, University of Wyoming.

Hinojosa Huerta, O., S. De Stefano, and W.W. Shaw. 2000. Abundance, Distribution, and Habitat Use of the Yuma Clapper Rail (*Rallus longirostris yumanensis*) in the Colorado River Delta, Mexico. USGS: Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson.

_____, H. Iturribarría-Rojas, and E. Zamora-Hernández. 2003. Status of the Yuma Clapper Rail and California Black Rail in the Colorado River Delta. Report for the Sonoran Joint Venture. Pronatura Sonora, San Luis Rio Colorado, Sonora, Mexico.

REVIEW ANALYSIS

- I. DPS Policy: Is the species under review listed as a Distinct Population Segment (DPS)?** No. However, the listed population of clapper rail is a defacto DPS because only the United States populations are listed, not those in Mexico. As part of this 5-year review, the three elements for the designation of a DPS were reviewed to determine if the clapper rail would qualify for a DPS designation (61 FR 4722). The United States population is discrete from the population in Mexico because it is delineated by the international boundary (2nd criterion for discreteness). Although migration and dispersal between United States and Mexico populations are not well understood, it is known that at least some populations on the LCR are resident (Eddleman 1989). There are significant differences in the level of protection and management afforded to the clapper rail in the United States and Mexico. United States populations are considered endangered under the Endangered Species Act, while the Mexican population is not listed under the Act. Although it is considered threatened under Mexico's endangered species act, there is little enforceable protection for the subspecies in Mexico. Further, the United States population is significant because its loss would significantly reduce the range and numbers of the subspecies (2nd criterion for significance).
- II. Recovery Criteria: Does the species have a recovery plan?** Yes. The Yuma clapper rail recovery plan was signed in 1983 (USFWS 1983). No revisions have been made to the plan.

A. Does the recovery plan contain downlisting, delisting, and/or uplisting criteria? Yes.

The recovery plan recommended downlisting the Yuma clapper rail at the time the recovery plan was being written, as a stable breeding population of 700-1000 individuals in the United States had been documented for 10 years. That population size reflects the clapper rail survey results between 1969 and 1981; a population viability analysis or other scientific rationale is not present in the plan to further explain or support the recommended population size. Downlisting of the Yuma clapper rail was considered in 1983 but never finalized.

The recovery plan contains the following delisting criteria: (1) clarification and evaluation of the breeding and wintering status of the species in Mexico; (2) surveys for the species and its habitat are established; (3) management plans are developed for important Federal and State controlled breeding areas; and (4) written agreements are effected with agencies having control or responsibility over clapper rail habitats in the United States and Mexico to protect sufficient breeding and wintering habitat to support a population of 700-1,000 breeding birds in the United States.

The step-down outline includes the following tasks: surveys for the species in the United States and Mexico, including an assessment of the status of the unlisted populations in Mexico; defining biological requirements and life history information; maintaining breeding and wintering habitat; and providing public information and outreach.

B. Do the recovery criteria for delisting, downlisting, and/or uplisting criteria address both biological factors and threats to the species?

The recovery plan contains downlisting and delisting criteria that were based on the known biology of the species and the identified threats (limiting factors) at the time. The presence and extent of marsh habitat and the availability of a forage base are identified in the recovery plan as the limiting factors to clapper-rail recovery. Decline in marsh habitat and forage base due to river management are identified as significant threats. Predation by mammals and birds and use of pesticides in or adjacent to clapper rail habitats are briefly mentioned, but the potential significance of the threat is not assessed. Hunting is not deemed a significant threat. The loss of marsh habitats on non-Federal lands due to riverfront development and increasing human use was not assessed as a threat to the clapper rail. The criteria address the threats of habitat loss on State and Federal lands due to river management through the development of written agreements and management plans to provide protection and management for those habitats. Criteria also address the need for improved information on the status of birds and their habitat in the United States and Mexico by calling for surveys and habitat evaluation.

Increasing selenium levels in important rail habitat has been identified as a new threat since the recovery plan was completed (see discussion in III), and urban development on private lands along the LCR and Gila River may also be adversely affecting clapper rail populations. While loss of wetlands is mitigated under the Clean Water Act section 404 requirements, ongoing human disturbance and introduction of contaminants may reduce habitat quality near these developments. Although these are newly recognized threats that were not specifically addressed in the recovery plan criteria or tasks, they can be considered components of the recovery criteria to maintain suitable breeding and wintering habitat. Similarly, although subsequent research (i.e., Eddleman 1989) has altered the known biology of the clapper rail and rendered moot some of the recovery plan tasks, the focus of the delisting criteria to provide for the maintenance of habitat to support the clapper rail populations throughout its range remains relevant.

In summary, the criteria are broadly threat-based and therefore require existing threats, as well as new threats, to be lessened and alleviated before the species can be considered recovered. However, the plan would not meet current recovery planning standards due to its lack of a detailed 5-factor analysis and lack of an adequate justification to support the population numbers (700-1,000 birds) identified in the downlisting and delisting criteria.

C. Discuss how each criterion has or has not been met.

With the available information from annual surveys, we are unable to ascertain if the downlisting criteria to maintain a stable population of 700-1,000 birds in the United States has been met. Populations have fluctuated 46% in the period 1995-2005, in part due to changes in survey effort, survey protocol and observer experience, and habitat changes.

The delisting criteria for evaluating the species' status in Mexico and providing for annual surveys in the United States have been met, although the total breeding habitat has not been surveyed every five years as recommended by the recovery actions. The annual surveys in the United States provide trend data on sites primarily on Federal and State lands, and although these have been conducted every year since 1972, the quality of the data has varied. Surveys during the last six years have been more consistent in terms of annual effort and consistent use of the protocol. The delisting criterion for development of management plans has been partially met and there are ongoing efforts to complete this task within the next two years. The delisting criterion for having written agreements to protect clapper rail habitat in the United States and Mexico has been partially met through the development and implementation of the management plans, and other planning documents such as Resource Management Plans by Bureau of Land Management for their lands on the LCR and the protective designation of the

Cienega within the Upper Gulf of California/Colorado River Delta Biosphere Reserve in Mexico.

III. Current Species Status and New Information

A. Improved Analyses: Has application of any improved analytic methods resulted in relevant new information? No.

We are in the process of modifying the annual clapper rail survey protocol to incorporate the Standardized North American Marsh Bird Monitoring Protocols (Conway 2005). Dr. Courtney Conway of the Cooperative Fish and Wildlife Research Unit, University of Arizona, is developing a call CD and data form for the official surveys that will be used starting in 2006. The new survey protocol will enable a more rigorous evaluation of annual survey data to provide more precise tracking of population trends and evaluation of the effects of marsh vegetation management actions. The new survey will not provide appropriate data to estimate populations; it will continue to show the number of birds counted. The annual survey data can be used to determine whether the recovery plan requirements for a breeding population of 700-1000 birds in the United States has been met, as the data represent a minimum number of birds present. The new survey also includes the California black rail (*Laterallus jamaicensis coturniculus*) and western least bittern (*Ixobrychus exilis hesperis*), two species of concern along the LCR.

B. Species Status and Baseline: New Information on Biology and Habitat

1. Population information: Information on clapper rail populations is obtained through annual habitat surveys in the United States. Transects established in the 1970s generally remain in use, although new transects have been established. Transects are placed in areas with significant marsh habitat and clapper rail populations; they are not randomly located. The purpose of the original survey protocol was to obtain population trend information. The survey data provide a count of individual clapper rails that respond to the taped calls on specified transects; it does not provide an estimate of the total population.

Clapper rail numbers on the survey routes fluctuate due to population dynamics, habitat quality, surveyor expertise, timing of the surveys within the official period, and other factors. Survey data have ranged from a low of 503 birds to a high of 900 in the last ten years: LCR data have ranged from 217-445; Gila River data has ranged from 10-116; and Salton Sea data has ranged from 234-523 (see Appendix C; also, survey information for Arizona was summarized by AGFD in response to a request for information for this status review (AGFD 2005), Appendix A). Two recent biological opinions (USFWS 2002, 2005) contain the most up-to-date summary of the species' status at the

Salton Sea and along the LCR, based on the survey information in Appendix C. The Virgin River population was adversely affected by winter floods that scoured marsh areas along the river (BLM 2005), and may take some time to recover depending on flows. The central Arizona population along the Gila River below Phoenix was also adversely affected by scouring due to winter flooding. However, damage to this habitat was not extensive and flows continue to support natural restoration. Clapper rail habitats on the lower Gila River near Yuma were not as affected as the central Gila habitats by the higher flows. Habitats and populations on the LCR and Salton Sea were not affected by recent weather events that altered flows in the tributaries.

The largest population of the clapper rail is found at the Cienega de Santa Clara in Mexico (Hinojosa Huerta *et al.* 2000, Hinojosa Huerta *et al.* 2003), a large wetland located in the state of Sonora east of the Colorado River channel that was re-created when saline drain water from the Yuma area was sent into Mexico via a drainage canal beginning in the 1980s. The estimated population at the Cienega has varied due to changes in habitat quality from a high of 6,300 in 1999 with a 23% decline through 2002 to 4,850 in 2003. During the 1960s and 1970s, significant Yuma clapper rail populations inhabited the Colorado River delta wetlands in Mexico. Some of these, particularly along the Rio Hardy, are being restored and the number of clapper rails is increasing (Hinojosa Huerta *et al.* 2003). While the birds in Mexico are not listed under the Endangered Species Act (they are listed as threatened by Mexico under their endangered species act), the stability of this population is important for the subspecies as a whole because this population, at 2-6 times the United States population, is the largest component of the total population and, if migration from this area to the United States does occur, these birds may be the source population for clapper rail populations throughout the range. In addition, studies of habitat components in the Cienega may provide important information for the management and creation of high quality habitat in the United States, as it supports the highest known density of clapper rails.

2. Demographic/life history information: Eddleman (1989) provides the most comprehensive information on clapper rail life history and habitat features. Research from the Cienega has clarified additional habitat components (Hinojosa Huerta *et al.* 2000). Significant new information on demographics and life history has not been developed since the completion of the Eddleman report.
3. Spatial distribution: Clapper rail populations in the United States are concentrated along the LCR from the vicinity of Laughlin, Nevada to Yuma, Arizona. Important clapper rail areas along the river include

four National Wildlife Refuges (NWR): Havasu, Bill Williams River, Cibola, and Imperial; and the state of Arizona's Mittry Lake Wildlife Area. At the Salton Sea in the Imperial Valley of southern California, important clapper rail areas include the Sonny Bono Salton Sea National Wildlife Refuge and the state of California's Imperial Wildlife Area. The third significant area in the United States is the Gila River from Phoenix to Yuma, Arizona, with population clusters along the river from Phoenix to Gila Bend, and in the lower portion of the river from Wellton to Yuma (Figure 1). Surveys are focused on these important habitat areas (see Appendix C). In the 10-year period from 1996-2005, rail survey data varied between 503 and 885 birds. Over this period, the Salton Sea habitats contained approximately half of the clapper rails detected, with the LCR supporting the other half. The Gila River populations are a smaller component.

Recent surveys for other bird species documented the presence of the rail around Lake Mead near Las Vegas, Nevada, in the lower Virgin and Muddy Rivers of southern Nevada, and northern Arizona. These records were summarized in Garnett *et al.* 2004 (Appendix C) and mentioned in the BLM response (BLM 2005 in Appendix A). These new Nevada locations are a minimum of 80 miles north of the previously known locations near Laughlin, Nevada. Because these new northern records resulted from the initiation of surveys undertaken for other species, it is not clear if these new locations represent a recent range expansion or if they are long established areas.

Clapper rail movement patterns, including migration and dispersal, between the United States populations and the populations at the Cienega de Santa Clara in Mexico are not well understood. The location of the winter range for migrants from the United States is unknown, but presumed to be in Mexico. Individuals from the Mexican population may disperse to the United States, potentially serving as important sources of genetic variance within the species, as they constitute the largest population unit. Eddleman (1989) documented that at least some portion of the clapper rail population on the LCR was resident (non-migratory). The degree of residency for clapper rails in central Arizona and southern Nevada is unknown. Information provided by AGFD in their scientific review of this 5-Year Review (AGFD 2006 in Appendix B) indicates that migration may occur in the central Arizona populations, but no studies have been initiated to track birds between population areas. Similarly, we have very limited general information on daily movements of adults or dispersing juveniles. However, the first records of clapper rails on the LCR and Salton Sea summarized in the recovery plan provide an inference that clapper rails can travel significant distances and successfully disperse to new habitats. The movement of clapper rails

up the Gila River to the Phoenix, Arizona area is another likely example, though distribution records do not provide certainty of this. The 2002 record for a clapper rail at Roosevelt Lake, 70 miles from the nearest Phoenix record, also suggests the dispersal ability of the species (USFWS 2003). Habitat that can be used by migrating, dispersing or transient individuals connects the LCR, Gila River, and Mexican populations, so movement of individuals is not precluded. The only examination of clapper rail genetics that has been conducted was part of a study of light-footed clapper rail genetic variability and provided limited data (Nusser *et al.* 1996). No other genetic information is available to compare the populations or make inferences about connectivity between populations.

4. Habitat requirements: Clapper rail habitat includes marshes along rivers, backwaters, and in drains or sumps supported by irrigation water (Eddleman 1989, Hinojosa Huerta *et al.* 2000). Most available habitat occurs in fixed locations where natural processes of marsh creation, destruction, and re-creation do not operate due to management control of the LCR water (USFWS 2005). Because of current water management regimes, marshes on the LCR age out of suitability over time due to build-up of dead plant materials that fill in water-filled depressions and result in the conversion of the marsh to dry land. As the marshes age and become decadent, they lose habitat suitability for clapper rails. Active management is then needed to maintain the marshes in place of the natural cycle of river flows. Along the Gila River below Phoenix, natural cycling of the marsh habitat still occurs, enabling marsh recovery after flood events. Declines in clapper rail numbers during surveys at established sites may be, in part, the result of marsh decadence in some areas.

At the Salton Sea, most clapper rail habitat was created in fields and farm units designed for waterfowl and other migratory birds, and the amounts remain relatively stable over time. Prescribed fire has been used at the Salton Sea on Sonny Bono Salton Sea NWR and Imperial Wildlife Area, and information on burned areas is provided during annual survey reports to the FWS. Prescribed fire is also used along the LCR on Mittry Lake Wildlife Area and Havasu and Imperial NWR as part of a research study on the effects of fire on clapper rails with the intent to restore habitat quality in overgrown cattail marshes. In the Cienega, maintenance of existing habitats has been identified as a critical need, resulting in funding through the Sonoran Joint Venture for a prescribed burn in 2005. Because questions remain about the efficacy of prescribed fire and the appropriate periodicity of application in clapper rail habitat, an ongoing study on the effects of prescribed fire to artificially set-back clapper rail habitats and allow for cattail re-growth is underway. Preliminary results of post-burn

monitoring suggest that the technique has promise for habitat management (Conway and Nadeau 2005); additional information on the appropriate application, benefits, and risks of this management will be available upon completion of the study.

Estimates of the total amount of rail habitat in the United States have not been made since the 1970s. Using information from management plans for the Salton Sea populations, the LCR NWR Comprehensive Management Plan (USFWS 1994), and recent data from the Cienega, marsh habitat that may contain suitable clapper rail habitat is estimated at greater than 10,000 acres for the Salton Sea and LCR (estimates for the Gila River are not available), and over 15,000 acres at the Cienega (see Appendix D).

C. Threats: Five-factor Analysis

1. New Information

a) The present or threatened destruction, modification, or curtailment of its habitat or range: The threat of selenium accumulation in the rail habitat has been identified as a potentially significant new threat since the recovery plan was written.

Eddleman (1989) identified selenium as a potential threat to the survival and recovery of the clapper rail. High levels of selenium can result in acute toxicity, chronic poisoning and tissue damage, and reproductive impairment (e.g., developmental abnormalities, embryo mortality, and reduced survival or growth of young) in birds. The adverse effects of selenium have been well documented in birds since the problem was identified at Kesterson NWR in the San Joaquin Valley of central California. The LCR (including the Salton Sea and Mexico) does not contain local sources of selenium that contribute to selenium levels in the biological environment. However, the Colorado River in the Upper Basin (Utah, Wyoming and Colorado) picks up selenium from the seleniferous soils of the Mancos shale formations (return flows of irrigation water are the primary vector) and transports it to the LCR. Selenium is concentrated in the water through evaporation, and then becomes deposited into the sediments and can be accumulated by vegetation, invertebrates, and fish. Clapper rails become contaminated through their diet of crayfish, other invertebrates, and fish. Even at the current level of 2 ppb in the LCR water, selenium is likely accumulating in sediments and clapper rail forage species. Levels of selenium in LCR-supported clapper rail habitats in the United States and Mexico may have increased over the last 10-15 years due to irrigation returns (historic data on pre-development selenium levels is not available) and are at levels above that considered of concern for reproductive impairment (King *et al.* 2000). Earlier studies (Rusk 1991, Roberts 1996, Andrews *et al.* 1997,

Garcia-Hernández *et al.* 2000) documented selenium as an issue of concern for the clapper rail in the LCR and the Salton Sea, and suggested that it could become a concern in the Cienega de Santa Clara in Mexico.

There is no documented evidence of reproductive impairment in the clapper rails; however, the cryptic nature of the species and difficulty in locating nests and young birds make casual observation of these effects extremely unlikely. Increases in selenium levels may threaten the ability of the habitats to support breeding populations of the clapper rails. Studies cited above have investigated the issue through surrogates (forage base, sediments, and other bird species) to frame the parameters of the problem. A proposal to assess selenium levels in clapper rails was developed and funded through the FWS Environmental Contaminants Division in 2006, with a completion date in 2011.

More generally, habitat modification and loss remains an ongoing concern in the recovery of the Yuma clapper rail (see discussion under New Information on Biology and Habitat). Increasing development along the LCR and interior Arizona rivers may have direct and indirect effects to clapper rail and habitat conditions, and water management regimes have the potential to impact clapper rail habitat. For example, while the Sonny Bono Salton Sea NWR and Imperial Wildlife Area populations at the Salton Sea will continue to receive LCR irrigation water, both entities must purchase this water from Imperial Irrigation District. Although these uses are considered high priority agricultural users, the cost and availability of the water is not guaranteed. With the Quantification Settlement Agreement (a California program to provide for intra-State water transfers to meet urban needs without exceeding the State's 4.4 million acre-feet/year LCR allocation), Imperial Irrigation District is capped at 3.1 million acre-feet per year, which is a reduction over its previous use. During times of shortage, lower priority uses could be cut back, and higher priority users may incur increased costs for water, both of which could limit supplies to the clapper rail habitats.

However, given that these types of threats remain, existing Federal and State-controlled habitats in the United States are more protected now than at the time of listing, and options for management have increased significantly. For example:

The recently approved LCR MSCP will provide substantial conservation benefit for LCR clapper rail habitats. The LCR MSCP is a 50-year, comprehensive Habitat Conservation Plan (HCP) that addresses the effects of water use and hydropower generation on the

LCR on 26 species including the clapper rail. The plan provides for creation of 512 acres of clapper rail habitat (a net gain of 269 acres over that presumed to be lost due to covered actions), maintenance of habitat quality, species monitoring and research efforts, and funding to maintain existing habitats along the LCR (particularly on the NWRs and Mittry Lake Wildlife Area) that are threatened with elimination over time by natural aging processes (LCR MSCP 2004). Clapper rail habitat will be created in a landscape mosaic on lands along the LCR corridor and in adjacent areas (lower Gila River, Virgin River) in proximity to currently inhabited areas.

The Bureau of Reclamation and California partners will create 190 to 652 acres of new marsh habitat at the Salton Sea to offset losses to Imperial Irrigation District drain habitats from reduced water flows and increased selenium levels due to water transfers (USFWS 2002, CDFG 2006) from the Imperial Irrigation District to California coastal cities. Future transfers would result in the implementation of additional conservation measures with similar effects. In addition, ongoing programs to protect and restore the avian and aquatic habitats present at the Salton Sea have committed to maintain existing important wildlife habitats, specifically including the clapper rail habitat on the Sonny Bono Salton Sea NWR and Imperial Wildlife Area. We anticipate that water for the refuge and wildlife areas will continue to be purchased from Imperial Irrigation District (availability and funding constraints may exist in the future and affect the amount and quality of the water provided) and will be canal-delivered LCR water, not drain water with its higher salinity and selenium levels. Canal delivery of LCR water will not prevent future increases of selenium in the habitats, as accumulation is already occurring, but it would result in less of an increase than would result from use of the higher selenium drain water.

Clapper rails in interior California outside of the two Salton Sea population centers will also be included in the Coachella Valley Multi-Species HCP, and, should the contemplated Imperial Irrigation District HCP be completed, the protection or restoration of the remainder of the important drain habitats would be included. In the Virgin River, clapper rails will be included in the Virgin River Conservation Plan, which may provide protection for existing habitats not currently protected, or provide for the development of new habitats. The only important clapper rail areas not included in conservation programs are those in the Phoenix area and the Gila River below Painted Rock Reservoir to Yuma. Clapper rail habitat in these areas exists on a patchwork of private, State, and limited Federal lands. The waters in the Gila River that support these marshes include treated effluent allowed to pass down river to agricultural users in the Phoenix area

and irrigation return flows or seepage flows in the lower reaches of the Gila River. Efforts to provide protection for some of these habitats through Safe Harbor or HCP planning have not begun.

Specific plans that guide habitat management for rails are in place on the Sonny Bono Salton Sea NWR and are under development for the LCR NWRs. The current Refuge plans on the LCR provide for the maintenance of endangered species habitats, but do not specifically describe the extent or commitment for clapper rails (USFWS 1994). A draft management plan exists for clapper rails on Bill Williams River NWR, and other plans are being developed by other Refuges on the LCR. Imperial Wildlife Area has a very specific management program to maintain habitat for the clapper rail. AGFD wildlife areas have management plans that provide for clapper rail habitats, particularly at Mittry Lake Wildlife Area on the LCR (AGFD 1997), Quigley Ponds on the lower Gila River, and Arlington Wildlife Area near Phoenix. Improvements to clapper rail habitats are planned for Quigley and Arlington, and Mittry Lake is a test area for prescribed fire.

Habitat protection for the Cienega de Santa Clara remains a significant threat to the clapper rail because the Cienega's water supply is entirely dependent on drain flows from the United States water, which could be cut at any time. The land base of the Cienega is protected in the Upper Gulf of California and Colorado River Delta Biosphere Reserve. And, plans for the management and enhancement of the wildlife value of the Cienega are included in the management of the Reserve and through the recent Bird Conservation Plan for the Colorado River Delta, Baja California and Sonora, Mexico (Hinojosa Huerta *et al.* 2004). However, with the recent five-year drought lowering the water levels in Lake Mead and potentially affecting water deliveries to Arizona that would reduce the amount of water in the LCR, there is considerable interest from Arizona water users in reducing the amount of Arizona's potential return flow water that currently goes to the Cienega (which reduces the amount of Arizona return flow credit since the water does not return to the LCR). Options to increase return flow credit include modifying the operation of the Yuma Desalting Plant, leasing of water from land-fallowing agreements, additional groundwater pumping to replace water currently diverted to the Cienega, and others. Some of these options would reduce the amount of water reaching the Cienega, resulting in a significant loss of marshlands that support the clapper rail. The United States has no formal responsibility to maintain the Cienega; however, a group of individuals, acting outside of their respective agencies, has prepared a white paper that examines methods to provide water savings without adversely impacting the Cienega.

This is an important step in a united effort to preserve this important habitat.

b) Overutilization for commercial, recreational, scientific or educational purposes: This is not a threat for the clapper rail.

c) Disease or predation: This is not a threat for the clapper rail, except in the context of increasing selenium levels causing threats to clapper rail health and reproductive success.

d) The inadequacy of existing regulatory mechanisms: This remains a significant threat for the Cienega de Santa Clara population. Until agreement is reached between the United States and Mexico on provision of water for the Cienega, this threat will not be abated (see discussion at C.1.a.).

e) Other natural or manmade factors affecting its continued existence: There are no other identified factors. The threat of selenium accumulation is discussed under “The present or threatened destruction, modification, or curtailment of its habitat or range.”

2. Threats Assessment (5-Factor Analysis): Given the updated information, provide an analysis of the threats to the species in the context of the 5 listing factors.

It is clear that threats to the clapper rail remain and impact the species to an unknown degree. The two most significant current or potential threats to the clapper rail are the increasing presence of selenium in their habitat and the lack of protection for the existing water source to the Cienega de Santa Clara. While we have not quantified the effects to clapper rail reproduction from current levels of selenium, levels are within the range of concern shown for reproductive effects in other bird species. We do not know if or when the effects of selenium may become apparent, but with the three major habitat areas (LCR, Salton Sea, and Cienega) all at some level of risk, this is a significant issue that requires further exploration. The options for reduction of selenium levels in rail habitat are not well known, but are likely to be difficult and have unknown likelihoods of success. Elimination of selenium from the LCR water is likely not a realistic option, whereas removal of contaminated sediments, plants, or prey items may be possible. Provision of a secure water source for the Cienega remains uncertain; however, the importance of this area for fish and wildlife species is well recognized and there is momentum to secure water for the area. Since, under any foreseeable circumstance, the water for the Cienega will be LCR water, selenium inflows will continue, with the potential for eventual build up of this contaminant in clapper rail

habitats.

The threat of habitat modification through water management regimes remains a concern, but significant habitat protection and management planning has mediated this threat to some degree. Although the primary clapper rail populations in the United States occur on Federal and State land, a full survey of potential clapper rail habitat that includes private lands in the United States has not been initiated, therefore the extent of the threat of habitat modification or loss on private land is not known.

D. Synthesis/ Current Status Assessment: Given the updated information on the species and threats, summarize the status of the species.

Clapper rail numbers recorded on surveys since 1969 have varied significantly due to a number of potential factors, including natural population fluctuations, the number, consistency, and quality of survey efforts, and habitat modifications from anthropogenic activities or natural events (Appendix E). There is no consistent pattern to the survey results, although some locations show more stability over time than others. Further, given the limits of the survey methodology, it is difficult to assess whether the population in the United States has ever been stable, or whether it is currently stable or increasing. Even the reasons for the survey number decreases and increases seen in more recent years (1995-2005) are not known, but are likely a combination of the same factors previously identified (e.g., changes in survey effort are known to have occurred in the last decade, particularly in the Imperial Division of the LCR where annual survey routes dropped from five to two in 1998 and no surveys were conducted in the Laguna Division for two years). However, regardless of data quality or methodology, the utility of assessing the data against the population recommendations in the recovery plan remains questionable, given the lack of justification for the selection of those numbers.

In summary, compared to the time of listing, the Yuma clapper rail populations in the United States remain small and little is known about their demographic stability. Protections for United States populations against habitat loss from river development actions have increased, as have conservation programs and management techniques to provide for habitat creation and maintenance over the long-term. However, habitat loss to the Cienega de Santa Clara population in Mexico remains a significant threat, and the continuing accumulation of selenium in the environment represents a currently unquantified risk to all clapper rail populations that may undermine other habitat improvements.

IV. Results:

- A. Given your responses to sections I, II, and III, does the 5-year review indicate that a change in classification is warranted? No.**

Protection of existing habitat on the LCR and the creation and maintenance of new habitat at the Salton Sea on NWRs and state wildlife areas has provided significantly greater habitat security since the species was listed. However, these habitats are still at risk of fragmentation, changes in hydrology, environmental contaminants, and urban development pressures that reduce habitat quality. Several other factors, including fragmentation and development pressures, have not been adequately assessed, but have the potential to limit expansion of the population within the known habitat areas. These factors do not provide for a level of security needed to justify a downlisting action.

Before the next 5-year review period (2010), we anticipate that several significant events will contribute greatly to our ability to assess the species' status: a dedicated water supply will be secured for the Cienega through the new Bypass Flow Restoration or Replacement Program initiated by the Bureau of Reclamation; five years of additional survey data based on the new protocol will be available from which to assess population trends; active clapper rail habitat management practices will be in place and under evaluation; the recovery plan will be revised (including revised recovery criteria) and additional tasks will have been implemented; the LCR MSCP will have had a chance to begin habitat creation and management actions that can be evaluated for success; and, information on the extent and effects of selenium contamination in rail habitat will enable us to determine the degree of risk from this contaminant.

- B. Priority Numbers: If the results of this review indicate a change in status is warranted, or a significant change in status/knowledge of the species, determine appropriate priority numbers.**

- 1. Recovery priority Number:** Based on this review, we recommend the recovery priority number for the Yuma clapper rail be changed to "9." This is based on a moderate degree of threat to the species (physical protection for most United States habitats and conservation activities in place or under development countered by new threats of unassessed magnitude), a high recovery potential, and that this is a subspecies. There are no significant economic or development conflicts identified that would require a 9C determination. Should the selenium research document reproductive impairment, the recovery potential would be reconsidered as low (requiring remediation of habitats which may not be possible) and the priority number would be changed to a "12" in the future.

2. **If applicable, indicate the Listing and Reclassification Priority Number (FWS only).**

Reclassification (from Threatened to Endangered) Priority Number:_____

Reclassification (from Endangered to Threatened) Priority Number:_____

Delisting (Removal from list regardless of current classification) Priority Number:_____

C. Recommendations for Future Actions:

1. The FWS should convene a group of species experts to revise the recovery plan tasks and criteria. Criteria should be revised based on a detailed five-factor analysis of current threats, including a reassessment of adequate population numbers. Revision of tasks should focus on those items from the 1983 Plan that are still relevant but have not been completed, as well as identification of additional tasks needed to support revised downlisting and delisting criteria. Recommended tasks include telemetry studies to identify clapper rail migration patterns and expansion of survey efforts to include areas not currently surveyed. To expand surveys, additional efforts from cooperating entities would be required. The AESO will have the lead for revising the recovery plan.
2. The FWS should be actively involved in the Bypass Flow Restoration or Replacement Program to work toward a secure, dedicated water source for the Cienega de Santa Clara. The AESO will have the lead for this action.
3. Implement the new survey protocol: provide training for all agency personnel who volunteer for the surveys, and monitor consistency and use of the new protocol. Use the data to assess trends in local populations and assess the adequacy of management actions. The AESO will have the lead for this action.
4. Complete development of management plans for NWR and State Wildlife Areas containing important clapper rail habitat. Work with other Federal agencies on Resource Management Plan revisions or other planning documents to ensure that management activities to maintain clapper rail habitat are included. Priority for planning activities should be focused on areas of declining clapper rail populations and/or marsh habitat quality. Develop Safe Harbor Agreements and Habitat Conservation Plans that include protection for and maintenance of clapper rail habitat on private lands. This effort should be coordinated by AESO with other cooperating FWS offices, AGFD, CDFG, and Nevada Department of Wildlife (NDOW).

5. Develop proposals and obtain funding for research to document the presence of selenium in various life stages of the clapper rail and its environment (including water, substrate, and forage base); assess the effects to reproduction and potential for mortality; and develop strategies to address possible adverse effects. This effort should be coordinated by the AESO Environmental Contaminants Division with cooperating FWS offices and State wildlife agency input.

V. References

- Andrews, B.J., K.A. King, and D.L. Baker. 1997. Environmental Contaminants in Fish and Wildlife of Havasu National Wildlife Refuge, Arizona. USFWS-Arizona Ecological Services Office-Contaminants Program. Phoenix, Arizona.
- Arizona Game and Fish Department. 1997. Mitty Lake Wildlife Area Management Plan. Phoenix.
- _____. 2005. 5-Year Review of Yuma Clapper Rail and Black Capped Vireo. Letter to Arizona Ecological Services Office, USFWS dated May 3, 2005.
- _____. 2006. Comments on Draft 5-Year Review. Letter to Arizona Ecological Services Office, USFWS, dated January 27, 2006.
- Bureau of Land Management. 2005. Response to Request for Information on the Yuma Clapper Rail for the 5-Year Review. Letter to Arizona Ecological Services Office, USFWS from Arizona Strip District, St. George, Utah dated February 11, 2005.
- California Department of Fish and Game. 2006. Comments on Draft 5-Year Review. Letter to Arizona Ecological Services Office, USFWS, dated January 31, 2006.
- Conway, C.J. 2005. Standardized North American Marsh Bird Monitoring Protocols. Wildlife Research Report #205-04. USGS- Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson.
- _____. and C.P. Nadeau. 2005. Effects of Fire on Yuma Clapper Rails and California Black Rails. 2004 Annual Report. Wildlife Research Report #2005-01. USGS-Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson.
- Eddleman, W.R. 1989. Biology of the Yuma Clapper Rail in the Southwestern U.S. and Northwestern Mexico. Report to U.S. Fish and Wildlife Service and Bureau of Reclamation. Wyoming Cooperative Research Unit, University of Wyoming.
- Garnett, M.C., J. Kahl, Jr., J. Swett, and E.M. Ammon. 2004. Status of the Yuma Clapper Rail (*Rallus longirostris yumanensis*) in the northern Mojave Desert compared with other parts of its range. Great Basin Birds 7 2004, pp. 6-15.

- Garcia-Hernández, J., K.A. King, A.L. Velasco, E. Shumilin, M. A. Mora, and E.P. Glenn. 2001. Selenium, selected inorganic elements, and organochloride pesticides in bottom material and biota from the Colorado River Delta. *Journal of Arid Environments* (2001) 49:65-89.
- Hinojosa Huerta, O., S. DeStefano, and W.W. Shaw. 2000. Abundance, Distribution, and Habitat Use of the Yuma Clapper Rail (*Rallus longirostris yumanensis*) in the Colorado River Delta, Mexico. Final Report to USFWS and INE/SEMARNAP Mexico. Agreement No: 1448-20181-98-G942. Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson.
- _____, H. Iturribarría-Rojas, and E. Zamora-Hernández. 2003. Status of the Yuma Clapper Rail and California Black Rail in the Colorado River Delta. Report for Sonoran Joint Venture. Pronatura Sonora, San Luis Rio de Colorado, Sonora, Mexico.
- _____, H. Iturribarría-Rojas, Y. Carrillo-Guerrero, M. de la Garza-Treviño, and E. Zamora-Hernández. 2004. Bird Conservation Plan for the Colorado River Delta. Pronatura Noroeste, Dirección de Conservación Sonora. San Luis Rio de Colorado, Sonora, Mexico.
- King, K.A., A.L. Velasco, J. Garcia-Hernandez, B.J. Zaun, J. Record, and J. Wesley. 2000. Contaminants in Potential Prey of the Yuma Clapper Rail: Arizona and California USA, and Sonora and Baja, Mexico, 1998-1999. USFWS-Arizona Ecological Services Office-Contaminants Program. Phoenix, Arizona.
- Lower Colorado River Multi-Species Conservation Program. 2004. Volume II: Habitat Conservation Plan. December 17, 2004. Jones & Stokes Inc. Sacramento, California.
- Nusser, J.A., R.M. Goto, D.B. Ledig, R.C. Fleischer, and M.M. Miller. 1996. RAPD analysis reveals low genetic variability in the endangered light-footed clapper rail. *Molecular Ecology* 1006. August: 5(4):463-72.
- Roberts, C.A. 1996. Trace Elements and Organochlorine Contamination in Prey and Habitat of the Yuma Clapper Rail in the Imperial Valley, California. USFWS-Carlsbad Fish and Wildlife Office-Division of Environmental Contaminants. Carlsbad, California.
- Rusk, M.K. 1991. Selenium Risk to Yuma Clapper Rails and Other Marsh Birds of the Lower Colorado River. Research Report. Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson.
- U.S. Fish and Wildlife Service. 1983. Yuma Clapper Rail Recovery Plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- _____. 1994. Lower Colorado River National Wildlife Refuges Comprehensive Management Plan. 1994-2014. USFWS-Region 2, Albuquerque, NM and Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada.

_____. 2002. Biological Opinion on the Bureau of Reclamation's Voluntary Fish and Wildlife Conservation Measures and Associated Conservation Agreements with the California Water Agencies. USFWS-Carlsbad Fish and Wildlife Office. Carlsbad, California.

_____. 2003. Biological and Conference Opinion for Issuance of a Section 10(a)(1)(B) Permit to Salt River Project for Operation of Roosevelt Lake. USFWS-Arizona Ecological Services Office, Phoenix, Arizona.

_____. 2005. Biological and Conference Opinion on the Lower Colorado River Multi-Species Conservation Program, Arizona, California, and Nevada. USFWS-Arizona Ecological Services Office. Phoenix, Arizona.

U.S. FISH AND WILDLIFE SERVICE

SIGNATURE PAGE for 5-YEAR REVIEW
Yuma Clapper Rail/*Rallus longirostris yumanensis*

CURRENT CLASSIFICATION: Endangered

PRE-1996 DPS LISTING CONSISTENT WITH DPS POLICY? Yes

RECOMMENDATION resulting from the 5-Year Review

 Delist Endangered to Threatened

 Threatened to Endangered x No Change

APPROPRIATE LISTING/RECLASSIFICATION PRIORITY NUMBER

REVIEW CONDUCTED BY: Lesley Fitzpatrick, Fish and Wildlife Biologist, AESO

See Service Manual for delegation of signature authority.

for Steve Spangle, Lead Field Supervisor, Fish and Wildlife Service

Approve *Ami Bak* Date 6-2-06

Do not Approve Date

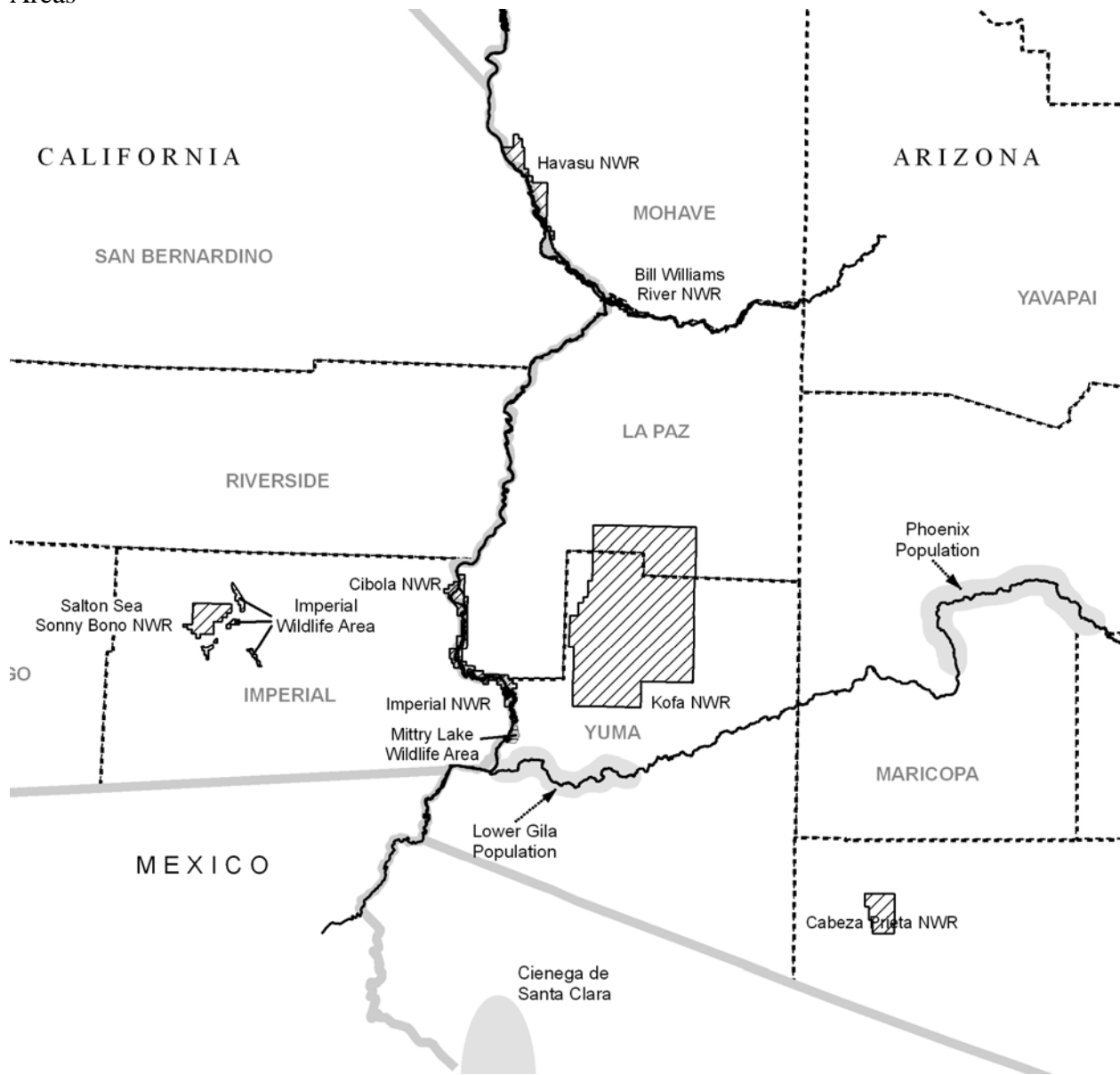
Lead Field Offices must ensure that all other Field Offices within the range of the species have been provided an adequate opportunity to review and comment prior to the review's completion. If it is concluded that a change in classification is warranted, written concurrence from other Field Offices is required.

Lead Assistant Regional Director, Ecological Services, Region 2,
Fish and Wildlife Service

Concur *Susan Jacobs* ACTING Date 9.11.06

Do not Concur Date

Figure 1: Yuma Clapper Rail Important Population Areas



Appendix A: Responses to Federal Register Notice

Citizens:

B. Sachau, 15 Elm St., Floral Park, New Jersey, 07932

Agencies:

Bureau of Land Management, Arizona Strip Office, St. George, Utah
Arizona Game and Fish Department, Phoenix, Arizona

Appendix B: Scientific Review Responses

Arizona Game and Fish Department
California Department of Fish and Game
FWS Region 1-Carlsbad Fish and Wildlife Office
FWS Region 1-Sonny Bono Salton Sea National Wildlife Refuge
FWS Region 2-Havasu National Wildlife Refuge
FWS Region 2-Imperial National Wildlife Refuge

Appendix C: Yuma clapper rail survey data 1995-2004

Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
LCR Sites											
Mohave Division	0	0	0	0	1	0	NS	0	0	NS	NS
Havasu NWR	77	53	68	85	44*	82	74	50	91	120	114
Havasu Division	NS	1	2	1	NS	NS	NS	7	0	NS	NS
Bill Williams River NWR	6	13	8	NS	11	2	9	6	10	17	7
Parker Division	1	3	0	NS	NS	NS	0	0	NS	NS	NS
Palo Verde Division	NS	0	0	NS	2	NS	9	NS	3	NS	NS
Cibola NWR	109	67	41	61	89	49	31	56	60	54	82
Imperial Division	86	117	104	1^	10	23	15	13	21	22	36
Imperial NWR	60	43	37	56	51	11	24	56	46	27	26
Laguna Division	99	102	137	65	87	90	53	60	119	63	46
Yuma Division	3	11	1	NS	6	NS	2	1	NS	5	1
Limitrophe Division	4	17	6	NS	0	NS	NS	3	NS	NS	9
Total LCR	445	427	404	269	301	257	217	252	350	308	321
Gila River Sites											
Lower Gila River	5	9	7	0	1	1	17	NS	3	64+	13~
Phoenix Area	26	32	20	8	15	11	44	57	35	52	28
Picacho Reservoir =	5	1	2	2	0	NS	0	NS	NS	NS	NS
Total Gila	36	42	29	10	16	12	61	57	38	116	41
Salton Sea Sites											
Imperial Wildlife Area	307	239	289	213	141	161	202	233	308	240	334
SBSS NWR	80	83	63	61	67	69	49	94	154	203	186
Drains etc.	32	43	29	26	18	4	4	3	1	1	3
Total Salton Sea	419	365	381	300	226	234	255	330	463	444	523
Total US	900	834	814	579	543	503	533	639	851	868	885

Key:

- *Only ½ of the Refuge was surveyed in this year
- ^ Survey routes reduced from 5 to 2 beginning this year
- +New area on Gila above Lower Gila and below Phoenix area identified and added to route
- ~Complete survey of lower Gila River sites above Yuma was not accomplished this year
- =Picacho Reservoir went dry in 2002 and has not refilled.

Survey Data for Nevada and Northern Arizona above Lake Mead.

Location	1998	1999	2000	2001	2002	2003	2004	2005
Virgin River: totals (1)	x	x	29	15	5	3	?	?
Littlefield Area			2	0	0	?	?	?
Mesquite Area			2	0	2	X	?	?
Mormon Mesa Area			16	14	3	X	?	?
Delta Area			-	-	-	X	?	?
Muddy River: totals (1)		1	3	0	7	3	?	?
Honeybee Pond (Overton WA)			1	0	0	^	^	^
Maverick Ditch			1	0	4	^	^	^
Las Vegas Wash	+	?	0	0	0	0	0	1

Key: Only a limited number of surveys have been done for the clapper rail in this area. Most detections occurred during surveys for other species, particularly the southwestern willow flycatcher.

? Unknown if species was detected during southwestern willow flycatcher surveys.

X Rails incidentally detected during southwestern willow flycatcher surveys.

^ No surveys known to be accomplished.

+ Survey documented presence of at least one clapper rail.

(1) Data summarized in Garnett *et al.* 2004 included some of the citations used to provide break-out numbers in this table. It was not clear from the data summary how the totals were obtained, whether through counting all clapper rails, or counting only the highest number of rails found at a site where there was more than one survey.

Appendix D: Estimated Habitat Acres for the Yuma Clapper Rail^.

Lower Colorado River#

Havasu National Wildlife Refuge	3,181
Bill Williams River National Wildlife Refuge	285
Cibola National Wildlife Refuge	1,326
Imperial National Wildlife Refuge	3,690
Mittry Wildlife Area	675
Subtotal:	9,157

Salton Sea*

Sonny Bono Salton Sea National Wildlife Refuge	198
Imperial Wildlife Area	1,263
Subtotal:	1,461

Total United States: 10,618

Mexico+

Cienega de Santa Clara	14,332
Other Colorado River Delta Sites	1,235
Subtotal:	15,567

^ Data for this appendix dates from 1994 to 2005 and is not the actual total of current existing habitat. Some suitable habitat for clapper rails exists on the LCR outside of the listed sites and there are no available estimates of the habitat on the Gila River.

Data from USFWS 1994 for LCR Refuges is an estimate of marsh habitat available at the time of the report. Data for Mittry Lake is from the 1997 management plan (AGFD 1997). These figures should be considered as estimates of marshes available, but not definitive clapper rail habitat. Marsh classification systems do not provide information on water depths and that is a component of clapper rail habitat suitability.

* Data is from NWR files and management plan for Imperial Wildlife Area for 2005. The available habitat on the Imperial Wildlife area varies somewhat from year to year. Of this total, approximately 1,450 is managed habitat and the rest is unmanaged but suitable.

+ Data is from Hinojosa Huerta *et al.* 2003

Appendix E: Yuma clapper rail compiled data for 1969-2005

YEAR	NUMBER
1969/70	157
1971	0 (no surveys done)
1972	182
1973	843 (included Mexico)
1974	943 (included Mexico)
1975	639
1976	59 (minimal survey effort)
1977	50 (minimal survey effort)
1978	318
1979	457
1980	535
1981	680 (included Mexico)
1982	444
1983	536
1984	400
1985	556
1986	466
1987	363 (partial survey)
1988	260 (partial survey)
1989	344 (partial survey)
1990	610
1991	837
1992	1012
1993	1076
1994	960
1995	900
1996	834
1997	814
1998	579
1999	543
2000	503
2001	533
2002	639
2003	851
2004	868
2005	885