

**Light-footed clapper rail**  
*(Rallus longirostris levipes)*

**5-Year Review:  
Summary and Evaluation**



Photo: USFWS

**U.S. Fish and Wildlife Service  
Carlsbad Fish and Wildlife Office  
Carlsbad, California**

**August 10, 2009**

## **5-YEAR REVIEW**

### Light-footed clapper rail (*Rallus longirostris levipes*)

#### **I. GENERAL INFORMATION**

##### **Purpose of 5-Year Reviews:**

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act) to conduct a review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. Our original listing of a species as endangered or threatened is based on the existence of threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act, and we must consider these same five factors in any subsequent consideration of reclassification or delisting of a species. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process defined in the Act that includes public review and comment.

##### **Species Overview:**

The light-footed clapper rail (*Rallus longirostris levipes*) is a medium sized, tawny, and gray-brown colored marsh bird which inhabits coastal marshes, lagoons, and their maritime environs in southern California, United States, and northern Baja California, Mexico. They require shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water (Zeiner et al. 1990, p. 174). A statewide abundance estimate was not available at listing, however, the number of light-footed clapper rails increased from 203 pairs in 1980 to 443 pairs in 2007. The light-footed clapper rail was listed as federally endangered on October 13, 1970 (USFWS 1970, p. 16047) and State endangered in California on June 27, 1971.

##### **Methodology Used to Complete This Review:**

This review was prepared by the Carlsbad Fish and Wildlife Office (CFWO), following the Region 8 guidance issued in March 2008. We used information from the Recovery Plan, census information from experts who have been monitoring various localities of this species, and the California Natural Diversity Database (CNDDB) maintained by the California Department of Fish and Game. The Recovery Plan, census reports, and personal communications with experts were our primary sources of information used to update the species' status and threats. We received a letter from the California State Attorney General and information relevant to this review is incorporated as needed. This 5-year review contains updated information on the species' biology and threats, and an assessment of that information compared to that known at the time of listing or since the last 5-year review. We focus on current threats to the species that are attributable to the Act's five listing factors. The review synthesizes all this information to

evaluate the listing status of the species and provide an indication of its progress towards recovery. Finally, based on this synthesis and the threats identified in the five-factor analysis, we recommend a prioritized list of conservation actions to be completed or initiated within the next 5 years.

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**Cooperating Field Office(s):** Steve Kirkland, Ventura Fish and Wildlife Office; (805) 644-1766. Review provided by Steve Kirkland July 2009.

**Federal Register (FR) Notice Citation Announcing Initiation of This Review:**

A notice announcing initiation of the 5-year review of this taxon and the opening of a 60-day period to receive information from the public was published in the Federal Register on March 5, 2008 (USFWS 2008, pp. 11945-11950).

**Listing History:**

**Original Listing**

**FR Notice:** 35 FR 16047

**Date of Final Listing Rule:** October 13, 1970

**Entity Listed:** Light-footed clapper rail (*Rallus longirostris levipes*), a bird subspecies.

**Classification:** Endangered

**State Listing**

The light-footed clapper rail (*Rallus longirostris levipes*) was listed by the State of California as endangered on June 27, 1971.

**Associated Rulemakings:** None.

**Review History:**

The Service initiated a 5-year review of light-footed clapper rail on July 22, 1985 (USFWS 1985b, pp. 29901-29909). The results of the review were published on July 7, 1987 (USFWS 1987, p. 25522). No change was proposed in that notice. No 5-year reviews have been initiated since 1985.

### **Species' Recovery Priority Number at Start of 5-Year Review:**

The recovery priority number for light-footed clapper rail is “6” according to the Service’s 2008 Recovery Data Call for the Carlsbad Fish and Wildlife Office, based on a 1-18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (USFWS 1983, pp. 43098 - 43105). This recovery priority number indicates that the taxon is a subspecies facing a high degree of threat and has a low recovery potential.

### **Recovery Plan or Outline:**

**Name of Plan or Outline:** *Light-Footed Clapper Rail Recovery Plan*

**Date Issued:** June 24, 1985 (revised)

**Dates of Previous Revisions:** July 1979

## **II. REVIEW ANALYSIS**

### **Application of the 1996 Distinct Population Segment (DPS) Policy**

The Endangered Species Act defines “species” as including any subspecies of fish or wildlife or plants, and any distinct population segment (DPS) of any species of vertebrate wildlife. This definition of species under the Act limits listing as distinct population segments to species of vertebrate fish or wildlife. The 1996 Policy Regarding the Recognition of Distinct Vertebrate Population Segments under the Endangered Species act (USFWS 1996, p. 4722-4725) clarifies the interpretation of the phrase “distinct population segment” for the purposes of listing, delisting, and reclassifying species under the Act. The light-footed clapper rail is not listed as a DPS. There is no new relevant information that would lead to the consideration of listing this taxon as a DPS in accordance with the 1996 policy.

### **Information on the Species and Its Status**

No background information was provided in the original listing rule. Therefore, the following sections on the biology and life history, distribution, abundance and population trends, genetics, and habitat conditions include information available at the time of listing as well as more recent information.

#### Species Description

The light-footed clapper rail is a hen-sized marsh bird and approximately 36 centimeters (14 inches) in length with a slightly down-curved bill longer than the head, and a short, upturned tail (Thelander and Crabtree 1994, p. 161). Its long legs and long toes are dull yellowish-gray. Males and females are identical in plumage. The cinnamon breast contrasts with the streaked plumage of its grayish-brown back and gray and white barred flanks. Most of the side of the head, including the cheeks, is gray. The chin and throat, and a line from the base of the bill to the top of the eye, are very light buff. Three subspecies of *Rallus longirostris* occur in California. The subspecies *R. l. obsoletus* and *R. l. levipes* occur in coastal salt marshes of

northern and southern California respectively. *R. l. yumanensis* occurs inland along the Salton Sea and lower Colorado River.

### Species Biology and Life History

Light-footed clapper rails are omnivorous and opportunistic foragers, which rely mostly on salt marsh invertebrates such as beetles (*Coleoptera*), garden snails (*Helix* spp.), California hornsnails (*Cerithidea californica*), salt marsh snails (*Melampus olivaceus*), fiddler and hermit crabs (including *Pachygrapsus crassipes*, *Hemigrapsus oregonensis*, and probably *Uca crenulata*), crayfish, isopods, and decapods (USFWS 1985a, p. 9).

The pair bond among light-footed clapper rails endures throughout the season, and often from year to year. Nesting usually begins in March and late nests hatch by August. Nests are placed to avoid flooding by tides, yet in dense enough cover to be hidden from predators and to support the relatively large nest (Storey et al. 1988). Typical nests in *Spartina* are elevated 4 to 18 inches (10-46 centimeters) above the ground. The outside edges of nesting platforms are typically woven into the surrounding live cordgrass which secures the nest as it floats during high tide. Nests typically include one or two ramps of vegetation leading to the ground, and a loosely-woven canopy of live stems and leaves. Females lay approximately 4 to 8 eggs, which hatch in 18 to 27 days. Both parents care for the young; one forages while, the other adult broods the chicks (USFWS 1985a, p. 7). In addition to the primary nest, where birds incubate eggs, adult clapper rails construct brood nests after the young have hatched.

Potential predators on eggs, nestlings, or adults include California ground squirrels (*Spermophilus beecheyi*), old world rats (*Rattus* spp.), striped skunk (*Mephitis mephitis*), feral house cats (*Felis catus*), dogs (*Canis familiaris*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), Virginia opossum (*Didelphis marsupialis*), and a variety of raptors (USFWS 1985a, pp. 9-10).

The light-footed clapper rail is resident in its home marsh except under unusual circumstances (Zembal 1994, p. 1). Within-marsh movements are also generally confined and usually of no greater spread than 1,312 feet (400 m) (Zembal et al. 1989, p. 40). However, a banded captive-bred female rail which was released at Point Mugu in August of 2004 was found in December of 2004 at Upper Newport Bay, a distance of 145 kilometers (90 miles) along the coast (Zembal et al. 2005, p. 29). Minimum home range sizes for nine clapper rails that were radio-harnessed for telemetry at Upper Newport Bay varied from approximately 0.8 to 4.1 acres (0.3 to 1.6 hectares) (Zembal et al. 1989, p. 40). The larger areas and daily movements were by first year birds attempting to claim their first breeding territories (Zembal et al. 1989, pp. 41-42).

### Spatial Distribution

The historical range of the light-footed clapper rail was originally described as extending from Santa Barbara County, California, United States, to San Quintin Bay, Baja California, Mexico (Cooke 1914; Grinnell et al. 1918, p. 290; Bent 1926, p. 275). In the early 1900s, ornithologists noted a decrease in the abundance of rails (Willett 1912, p. 32) and observed that they were no longer found in areas, which were formerly occupied (Grinnell 1915, p. 46). Since 1900, 75

percent of the coastal estuaries and wetlands in southern California have been destroyed or adversely modified. In this same time frame, two-thirds of 28 larger estuaries in southern California have been dredged or filled (California Coastal Zone Conservation Commission 1975, p. 39). The Recovery Plan states:

“...major losses occurred because of destruction of habitat. Edwards (1922, p. 61) describes one area which one year had “close to a dozen nests,” and the next year was buried under several feet of dredged mud and sand...Dredging and filling for various reasons continued at an accelerated rate until only about 3,441 hectares (8,500 acres) of salt marsh remained in the early 1970s between Santa Barbara and the Mexican Border, an area that at one time had an estimated 10,256 hectares (26,000 acres) of salt marsh (Speth 1971, p. 51). Particularly hard hit were several areas known to have supported large populations of light-footed clapper rails: San Diego Bay, reduced from 996 hectares (2,450 acres) to 146 hectares (360 acres); Mission Bay, from 972 hectares (2,400 acres) to 8.5 hectares (21 acres); and the Los Angeles-Long Beach area, from 2,753 hectares (6,800 acres) to 28.3 hectares (70 acres)” (USFWS 1985a, pp. 19-20).

The range in California now extends from Ventura County in the north to the Mexican border in the south (Figure 1). Light-footed clapper rails have not been detected in Santa Barbara County since 2004 or in Los Angeles County since 1983 (Zemba et al. 2008, pp. 11-13). Predation by cats, foxes, and other predators is a likely cause for extirpation in Carpinteria Marsh in Santa Barbara County. Today the northern most marsh occupied by light-footed clapper rail is Mugu Lagoon in Ventura County (Zemba et al. 2007, p. 9). This is the largest functioning salt marsh along the coast of southern California today consisting of 1,012 hectares (2,500 acres) of marsh lands. It represents over 25 percent of the potential habitat for the light-footed clapper rail (Zemba et al. 2008, p. 4). Seal Beach National Wildlife Refuge (NWR) contains about 229 hectares (565 acres) of marsh lands along with associated mudflats and channels of open water (Zemba et al. 2008, p. 4). Southern California’s largest population of light-footed clapper rails is located in Upper Newport Bay and is an Ecological Reserve of the California Department of Fish and Game. It contains 105 hectares (260 acres) of marsh lands (Zemba et al. 2008, p. 4). Tijuana Slough NWR in southwestern San Diego County contains about 425 hectares (1,051 acres) of wetlands.

Distribution within the range of the light-footed clapper rail has been discontinuous because salt marsh habitats occur sporadically along the coastline. However, it is believed that most of the coastal salt marshes at one time supported clapper rails between Santa Barbara and the Mexican border. In the early 1970s, soon after the light-footed clapper rail was listed as endangered, only about 3,441 hectares (8,500 acres) of salt marsh remained (Speth 1971, p. 51). Today there are approximately 3,156 hectares (7,798 acres) of coastal salt marsh habitat left from Santa Barbara south to the Mexican border, (SCCWRP 2008).

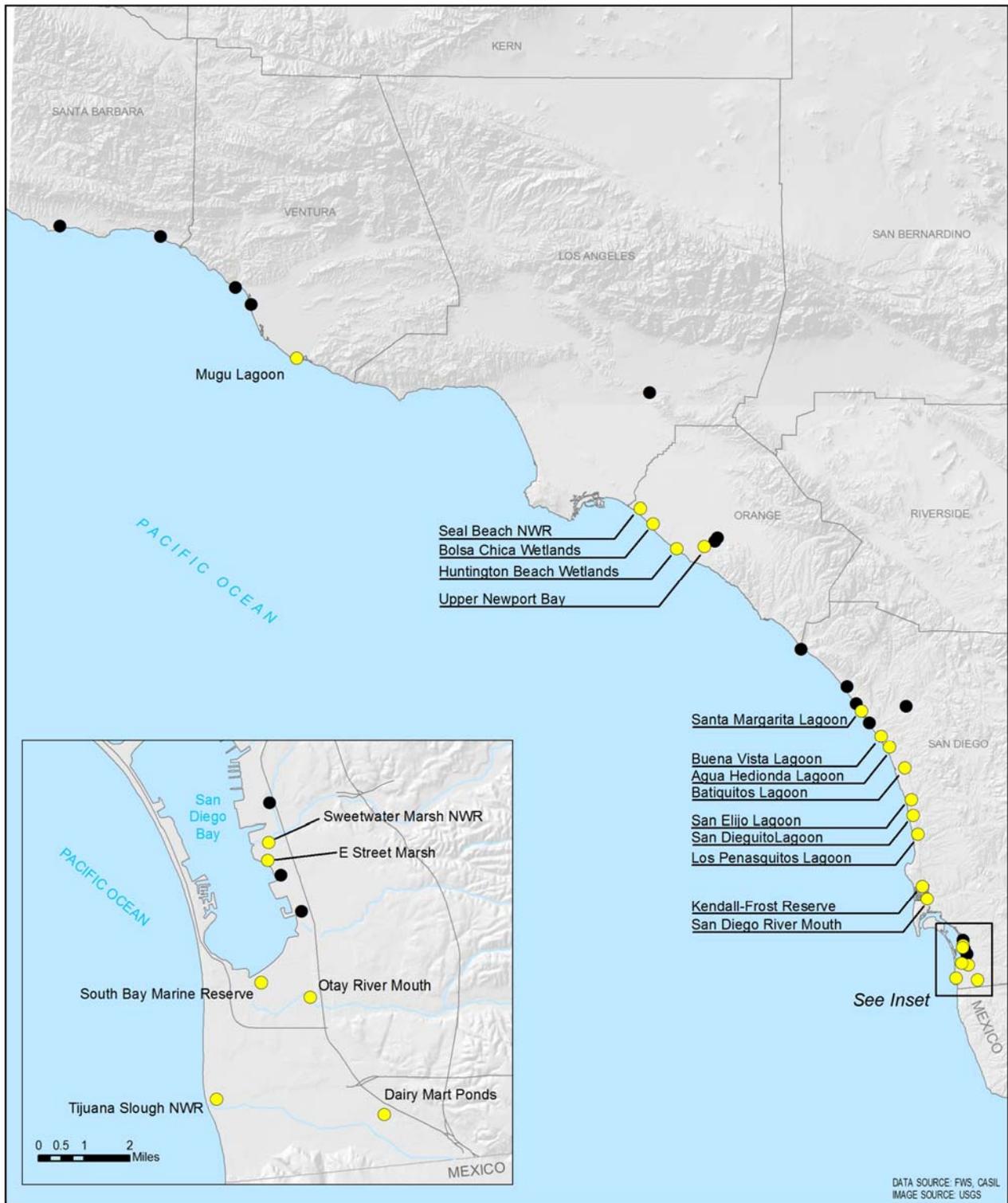
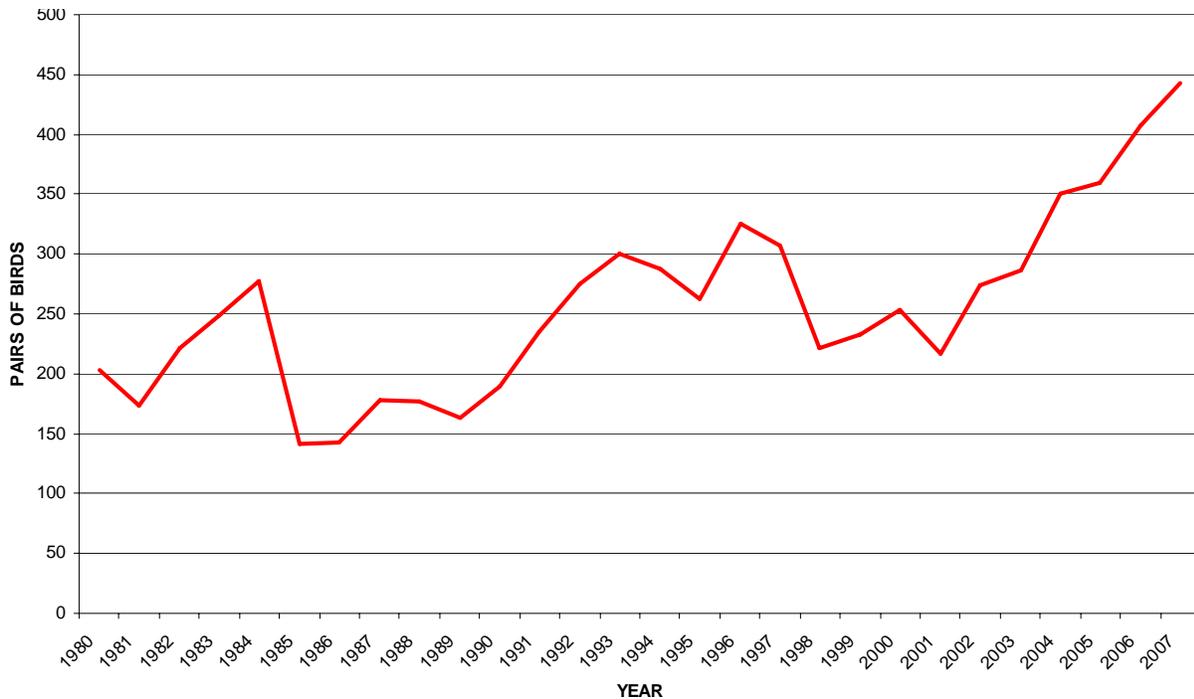


Figure 1. Current and potential distribution of the light-footed clapper rail in California.

## Abundance

There is no data for statewide abundance of the light-footed clapper rail at listing in 1970. Wilbur (1974, p. 870) gave a preliminary estimate of 500-750 individual birds in California. He based this number on his field work in selected marshes from 1972-1973. Several years later Wilbur *et al.* (1979) felt that this first estimate was too high and that no more than 300 light-footed clapper rails occurred in California (Wilbur *et al.* 1979, p. 251). Annual statewide light-footed clapper rail censuses began in 1980 and 11 marshes were censused; 203 pairs of light-footed clapper rails detected. These censuses show an erratic fluctuation in the number of rails detected over the years (Figure 2). Since 1980, the lowest number of pairs detected was 142 in 1985 when 14 marshes were surveyed. The highest number of pairs detected was 443 in 2007 when 19 marshes were censused. Of these 19 marshes, 8 of them had almost 92 percent of the grand total light-footed clapper rail pairs counted in 2007. These marshes include, from north to south; Mugu Lagoon, Seal Beach NWR, Upper Newport Bay, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Penasquitos Lagoon, and Tijuana Slough NWR. Of these, Upper Newport Bay and Tijuana Slough NWR together represent 69 percent of the grand total of pairs counted in 2007 (Zembal *et al.* 2007, p. 6).

Preliminary data for 2008 shows a steep decline in light-footed clapper rail numbers in the largest California populations. In Upper Newport Bay 88 pairs were detected, a 53 percent decline from 2007. In Tijuana Slough NWR only 47 pairs were detected, a 33 percent decline from 2007 (Zembal 2008, p. 1).



**Figure 2: Light-footed clapper rail census results in California. Data from Zembal *et al.* 2007.**

The Upper Newport Bay population of light-footed clapper rails has been the largest since the statewide census began in 1980, and likely has been for decades. It has typically consisted of 100 pairs of rails or more and has recovered the few times that it dropped below this threshold. In contrast, the second and third largest populations at Seal Beach NWR and Tijuana Slough NWR have been dramatically affected by major environmental perturbations. These larger populations have subsequently rebounded, but only after many years of intensive management. Each of the smaller populations is under constant threat of extirpation because of the extremely small population sizes.

The status of light-footed clapper rail in Mexico is not well documented. Surveys of two marshes in Baja Mexico were conducted in 1981 and 1986 (Zembal and Massey 1986, pp. 6-13). At El Estero de Ensenada about 25 percent of the marsh was surveyed in 1981 and 68 pairs were counted. In 1986, over 50 percent of the marsh was surveyed and 64 pairs were counted. At Bahia de San Quintin, approximately 33 percent of the marsh was surveyed in 1981 and 107 pairs were counted. In 1986, about 66 percent of the marsh was surveyed and 179 pairs were counted (Zembal and Massey 1986, pp. 6-13). Possibilities for the lower numbers in 1986 include surveying after the nesting season began when the rails are less vocal, surveying during poorer weather conditions, or a large reduction in rail numbers similar to the populations in southern California during the same time period. Little is known regarding the portion of the population of light-footed clapper rails, which exists outside of our border in Mexico and at this time, an abundance estimate is unavailable.

#### Habitat or Ecosystem

The light-footed clapper rail uses coastal salt marshes, lagoons, and their maritime environs (Zembal 1994, pp. 1-2). Nesting habitat includes tall, dense cordgrass (*Spartina foliosa*) and occasionally in pickleweed (*Salicornia virginica*) in the low littoral zone, wrack deposits in the low marsh zone, and hummocks of high marsh within the low marsh zone (Massey et al. 1984, p. 78). At Mugu Lagoon nesting occurs in stands of (*Juncus acutus* spp. *leopoldii*) (Zembal et al. 2007, p. 5). Fringing areas of high marsh serve as refugia during high tides (Zembal et al. 1989, p. 42). Although used infrequently, this habitat may be extremely important for reducing mortality during high tides. Although less common, light-footed clapper rails have also been observed to reside and nest in freshwater marshes (Thelander and Crabtree 1994, p. 161). Activities of the light-footed clapper rail are tide-dependent (Zembal et al. 1989, pp. 39-42). They require shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water (Zeiner et al. 1990, p. 174). They forage in all parts of the salt marsh, concentrating their efforts in the lower marsh when the tide is out, and moving into the higher marsh as the tide advances.

#### Changes in Taxonomic Classification or Nomenclature

The light-footed clapper rail (*Rallus longirostris levipes*) was listed as endangered in 1970 under the Act. Clapper rails display much geographic variation with more than 20 recognized subspecies (Oberholzer 1937; Eddleman and Conway 1998). The 1985 recovery plan includes a brief record of the various historical placements of animals now considered light-footed clapper rails (USFWS 1985a, p. 2). The light-footed clapper rail has been recognized as *Rallus*

*longirostris levipes* since Oberholser revised the clapper rail complex in 1937 (Oberholser 1937, pp. 338–339).

Since listing, additional information and new comparative techniques have become available. However, that has not resulted consensus at the species rank on the distinctiveness of clapper rails (*Rallus longirostris*) and the closely related king rails (*R. elegans*), nor is there agreement on the circumscription and placement of subspecific taxa of these species. Avise and Zink (1988, pp. 516–528), in an analysis of the genetic structure of mitochondrial DNA (mtDNA) and allozymes, found the king and clapper rails to be closely related species; while Olson (1997, pp. 93–111), using morphometric data, suggested king and clapper rails were distinguishable but that the *Rallus* subspecies from western North America are more closely allied with king rails. Based on Fleischer’s unpublished data (reported in Fleischer et al. 1995, p. 1241; see also Chan et al. 2006, p. 60), mtDNA data showed virtually no differentiation between *R. longirostris levipes* and *R. l. yumanensis* as well as other cited clapper rail subspecies; however, Fleischer et al. (1995, p. 1241), using microsatellite DNA, noted little gene exchange between *R. l. levipes* and *R. l. yumanensis*. Because we do not have clear information to the contrary, we continue to define the light-footed clapper rail (*Rallus longirostris levipes*) as a subspecies under the Act’s definition of “species”.

### Genetics

The light-footed clapper rail exhibits low levels of genetic variability as determined by variation in microsatellite DNA, matching or nearly matching the levels of highly inbred species such as the Guam rail (*Rallus owstoni*) and captive Nene (*Branta sandvicensis*). In contrast, the subspecies, *Rallus longirostris yumanensis*, found inland along the Salton Sea and lower Colorado River, exhibits genetic variability typical of many avian and other taxa. This suggests that variation may have been lost in light-footed clapper rail through genetic drift, inbreeding and/or a bottleneck (Fleischer et al. 1995, p. 1240). Nusser et al. (1996) also found a very low level of genetic variability in light-footed clapper rail using randomly amplified polymorphic DNA (RAPD) analysis. They suggest historically small populations, a prehistoric bottleneck, habitat instability, and recent population declines may have contributed to this very low variability (Nusser et al. 1996, p. 469).

### Species-specific Research and/or Grant-supported Activities

Annual statewide light-footed clapper rail censuses have been occurring since 1980 as a group effort by federal, state and local government agencies, and the public. A total of 16 marshes were censused in 1980 and 30 marshes were censused in 2007. Captive rearing is occurring at three facilities; Chula Vista Nature Center, San Diego Zoo’s Wild Animal Park, and Sea World.

### Captive Breeding and Translocation

In 1998, a captive breeding and translocation program was initiated adjacent to the Sweetwater NWR at the Chula Vista Nature Center in San Diego County (Bayfront Conservancy Trust 1995). The first pair of light-footed clapper rails were captured in Upper Newport Bay and transferred to the Chula Vista Nature Center in 1998 and by 2007 there were six pairs in three

facilities. Captive birds were first successfully bred in 2001 and seven chicks were released into Mugu Lagoon that year (Zemba et al. 2008, p. 8). Over the seven years of the program, 164 captive-reared birds have been released into ten different marshes in California (Zemba et al. 2008, p. 25). Eggs have also been translocated from Upper Newport Bay to the Mugu Lagoon when nesting attempts between the two sites were synchronous (Zemba and Hoffman 1999, 2000).

### **Five-Factor Analysis**

The following five-factor analysis describes and evaluates the threats attributable to one or more of the five listing factors outlined in section 4(a)(1) of the Act.

#### **FACTOR A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range**

The final listing rule for light-footed clapper rail was published in the Federal Register on October 13, 1970 (USFWS 1970, p. 16047). This predates the Act and consists of a list of native fish and wildlife considered to be threatened with extinction. No supporting information was given regarding the threats to the light-footed clapper rail or its habitat at that time.

#### Development

Relatively soon after listing, the direct loss of coastal wetlands including coastal salt marsh habitat was largely eliminated as a result of current laws and regulations protecting coastal habitats (see Factor D below). The California Coastal Act of 1976 and the Clean Water Act of 1972 have been effective mechanisms at protecting habitat for the light-footed clapper rail. Federal and State protections for light-footed clapper rail do not, however, protect the Tijuana River estuary from proposed water-sewage treatment effluents entering the estuary from the headwaters and watershed of the Tijuana River in Mexico. Major habitat loss due to development is now unlikely for the remaining light-footed clapper rail habitat.

Conservation measures to increase and improve habitat suitable for the light-footed clapper rail have occurred at several southern California coastal marshes. More than 202 hectares (500 acres) of marine and wetland habitat have been recreated or rehabilitated at Bolsa Chica Wetlands in Orange County. This included opening the wetland to full tidal influence in 2006. Artificial nesting rafts have been placed in seven marshes throughout the species' range since 1988 and have been utilized by light-footed clapper rails at three of these: Seal Beach NWR, Kendall-Frost Reserve, and Sweetwater Marsh NWR. Nesting rafts offer protected nesting sites in marshes with a low supply of good natural nesting sites. Translocations and captive breeding have also been attempted to augment smaller populations of light-footed clapper rails.

#### Siltation

Siltation of lagoons and river mouths from urban runoff has contributed to the degradation and modification of light-footed clapper rail habitat in southern California (Wilbur 1974, p. 870; Massey et al. 1984, pp. 68, 77; Wiley and Zemba 1989, p. 6). An example of adverse impacts to

habitat occurred at Tijuana Slough NWR in 1985 when detectable clapper rail breeding activity was eliminated following closure of the ocean inlet and the disappearance of tidal influence (Zemba et al. 1998, p. 3). Degradation of light-footed clapper rail habitat by siltation has the potential to be a significant threat to the species' long-term survival.

### Contaminants

Environmental contaminants may also adversely impact light-footed clapper rail habitats. Non-point source pollution such as organochlorines is a primary cause for the loss of light-footed clapper rail habitat. Sources for this type of contamination in southern California have historically been sewage, industrial wastes, herbicides and pesticides. Marshes are also the recipients of unregulated "emerging" contaminants including polybrominated diphenyl ethers (PBDEs), and new generation pesticides such as pyrethroids. Absent any natural sources, releases of PBDEs are expected to be greatest in areas where their use is greatest, such as areas with dense residential and industrial development. Contaminants may reach light-footed rail habitat by tidal influences, surface and groundwater sources, or direct application of pesticides within marsh habitats. Within the marsh, contaminants may absorb or attach to sediment and negatively impact light-footed clapper rail food sources (Goodbred *et al.* 1996, p. 2).

### Summary of Factor A

The destruction of suitable marsh habitat is no longer the primary threat to the light-footed clapper rail. Acquisition of land and conservation easements has resulted in the preservation of salt marsh habitat for the species. Of the total 29 marshes censused in 2007, 28 are located on public lands that are not subject to large-scale, land-use conversion. The remaining marsh at San Dieguito Lagoon in Del Mar is currently undergoing wetlands restoration by Southern California Edison. However, degradation or modification of light-footed clapper rail habitat is likely to remain a threat from dredging actions, changes to tidal influences or siltation, and contaminants from urban runoff. Active management is needed to maintain and create new habitat.

### **FACTOR B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes**

Overutilization for commercial purposes was not known to be a factor at the time of listing (USFWS 1970, pp. 16047-16048). We believe overutilization for any purpose does not appear to be a threat at this time.

### **FACTOR C: Disease or Predation**

Disease was not known to be a factor at the time of the final listing rule in 1970 (USFWS 1970, pp. 16047-16048). Wildlife diseases have the potential to affect host populations, though no specific diseases have been identified as a threat to the light-footed clapper since listing. It is unclear whether West Nile virus and avian influenza will impact the light-footed clapper rail; to date direct mortalities from either of these diseases in California are unknown.

Predation of light-footed clapper rail eggs by raccoons (*Procyon lotor*) have been recorded at Upper Newport Bay. There were 12 nests found at this marsh in 2007, but four of those nests were predated by raccoons (Zemba et al. 2008, p. 2). Red foxes (*Vulpes vulpes*), feral cats (*Felis catus*), and a variety of raptorial birds are known predators of light-footed clapper rails (Brian Collins, U.S. Fish and Wildlife Service, pers. comm. 2008; Zemba et al. 2008, p. 5). At Seal Beach NWR, heavy predation occurred over several years as mesopredator release (Soule et al. 1988, p. 84) resulted from the elimination of native top carnivores, most likely the coyote (*Canis latrans*), and an increase in the local population of nonnative foxes (*Vulpes vulpes*). This resulted in the near elimination of light-footed clapper rail breeding at Seal Beach NWR (Zemba et al. 2008, pp. 15-17). New studies are needed to gather information on the effect of predation on rail population sizes.

Implementation of predator control programs have resulted in an increase of rail numbers, specifically at Seal Beach NWR. In 1986 the Service and the U.S. Navy began trapping and removing red foxes from Seal Beach NWR. The first red fox den on the refuge was found in 1980. A total of 59 foxes were removed during the first year of trapping in 1986. Over the next two years 185 red foxes were removed and by 1989 the rail numbers rebounded to the highest levels recorded. Since that time the rail numbers have fluctuated and are currently down again. The stimulus for the decline is unknown but one possibility could be raptor predation (Zemba et al. 2008, pp. 14-17).

#### **FACTOR D: Inadequacy of Existing Regulatory Mechanisms**

There are several State and Federal laws and regulations that are pertinent to federally listed species, each contributing to the conservation the light-footed clapper rail. These laws, most of which have been enacted in the past 30 to 40 years, have greatly reduced or eliminated the threat of habitat destruction.

#### **State Protections in California**

California Endangered Species Act (CESA): The light-footed clapper rail is listed as endangered under CESA (California Fish and Game Code, section 2080 *et seq.*). The CESA prohibits the unauthorized take of State-listed threatened or endangered species and requires State agencies to consult with the California Department of Fish and Game on activities that may affect a State-listed species and mitigate for any adverse impacts to the species or its habitat. Pursuant to CESA, it is unlawful to import or export, take, possess, purchase, or sell any species or part or product of any species listed as endangered or threatened. The State may authorize permits for scientific, educational, or management purposes, and to allow take that is incidental to otherwise lawful activities.

California Environmental Quality Act (CEQA): The CEQA requires review of any project that is undertaken, funded, or permitted by the State or a local governmental agency. If significant effects are identified, the lead agency has the option of requiring mitigation through changes in the project or to decide that overriding considerations make mitigation infeasible (CEQA section 21002). Protection of listed species through CEQA is, therefore, dependent upon the discretion of the lead agency involved.

Natural Community Conservation Planning Act (NCCP): The NCCP is a cooperative effort to protect regional habitats and species. The program helps identify and provide for area wide protection of plants, animals, and their habitats while allowing compatible and appropriate economic activity. Many NCCPs are developed in conjunction with Habitat Conservation Plans (HCPs) prepared pursuant to the Act.

California Lake and Streambed Alteration Program: The Lake and Streambed Alteration Program (California Fish and Game Code sections 1600-1616) may promote the recovery of listed species in some cases. This program provides a permitting process to reduce impacts to fish and wildlife from projects affecting important water resources of the State, including lakes, streams, and rivers. This program also recognizes the importance of riparian habitats to sustaining California's fish and wildlife resources, including listed species, and helps prevent the loss and degradation of riparian habitats.

California Coastal Act: The California Coastal Commission considers the presence of listed species in determining environmentally sensitive habitat lands subject to section 30240 of the California Coastal Act of 1976, which requires their protection. Certain local jurisdictions have developed their own Local Coastal Programs or Land Use Plans that have been approved by the Coastal Commission. Some of the major accomplishments of this act include reduction in overall development, the acquisition of prime habitat along the coast, restoration of coastal streams and rivers, and a reduction in the rate of wetland loss.

### **Federal Protections**

National Environmental Policy Act (NEPA): NEPA (42 U.S.C. 4371 *et seq.*) provides some protection for listed species that may be affected by activities undertaken, authorized, or funded by Federal agencies. Prior to implementation of such projects with a Federal nexus, NEPA requires the agency to analyze the project for potential impacts to the human environment, including natural resources. In cases where that analysis reveals significant environmental effects, the Federal agency must propose mitigation alternatives that would offset those effects (40 C.F.R. 1502.16). These mitigations usually provide some protection for listed species. However, NEPA does not require that adverse impacts be fully mitigated, only that impacts be assessed and the analysis disclosed to the public.

Clean Water Act: Under section 404, the U.S. Army Corps of Engineers (Corps or USACE) regulates the discharge of fill material into waters of the United States, which include navigable and isolated waters, headwaters, and adjacent wetlands (33 U.S.C. 1344). In general, the term "wetland" refers to areas meeting the Corps's criteria of hydric soils, hydrology (either sufficient annual flooding or water on the soil surface), and hydrophytic vegetation (plants specifically adapted for growing in wetlands). Any action with the potential to impact waters of the United States must be reviewed under the Clean Water Act, National Environmental Policy Act, and Endangered Species Act. These reviews require consideration of impacts to listed species and their habitats, and recommendations for mitigation of significant impacts. Because this is a coastal species, impacts to watersheds may address light-footed clapper rails.

The Corps interprets “the waters of the United States” expansively to include not only traditional navigable waters and wetlands, but also other defined waters that are adjacent or hydrologically connected to traditional navigable waters. However, recent Supreme Court rulings have called into question this definition. On June 19, 2006, the U.S. Supreme Court vacated two district court judgments that upheld this interpretation as it applied to two cases involving “isolated” wetlands. Currently, Corps regulatory oversight of such wetlands (e.g., vernal pools) is in doubt because of their “isolated” nature. In response to the Supreme Court decision, the Corps and the U.S. Environmental Protection Agency (USEPA) have recently released a memorandum providing guidelines for determining jurisdiction under the Clean Water Act. The guidelines provide for a case-by-case determination of a “significant nexus” standard that may protect some, but not all, isolated wetland habitat (USEPA and USACE 2007). The overall effect of the new permit guidelines on loss of isolated wetlands, such as vernal pool habitat, is not known at this time.

Endangered Species Act of 1973, as amended (Act): The Act is the primary Federal law providing protection for this species. The Service’s responsibilities include administering the Act, including sections 7, 9, and 10 that address take. Since listing, the Service has analyzed the potential effects of Federal projects under section 7(a)(2), which requires Federal agencies to consult with the Service prior to authorizing, funding, or carrying out activities that may affect listed species. A jeopardy determination is made for a project that is reasonably expected, either directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its reproduction, numbers, or distribution (50 CFR 402.02). A non-jeopardy opinion may include reasonable and prudent measures that minimize the amount or extent of incidental take of listed species associated with a project.

Section 9 prohibits the taking of any federally listed endangered or threatened species. Section 3(18) defines “take” to mean “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Service regulations (50 CFR 17.3) define “harm” to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harassment is defined by the Service as an intentional or negligent action that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. The Act provides for civil and criminal penalties for the unlawful taking of listed species. Incidental take refers to taking of listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity by a Federal agency or applicant (50 CFR 402.02). For projects without a Federal nexus that would likely result in incidental take of listed species, the Service may issue incidental take permits to non-Federal applicants pursuant to section 10(a)(1)(B). To qualify for an incidental take permit, applicants must develop, fund, and implement a Service-approved HCP that details measures to minimize and mitigate the project’s adverse impacts to listed species. Regional HCPs in some areas now provide an additional layer of regulatory protection for covered species, and many of these HCPs are coordinated with California’s related NCCP program.

The light-footed clapper rail is a covered species under the San Diego Multiple Species Conservation Program (MSCP). Within the MSCP boundary, 93 percent (688 hectares (1,700

acres)) of potential light-footed clapper rail habitat will be conserved and 7 percent (49 hectares (120 acres)) may be potentially impacted or developed (Table 3-5 in City of San Diego 1998).

Sikes Act: The Sikes Act (16 U.S.C. 670) authorizes the Secretary of Defense to develop cooperative plans with the Secretaries of Agriculture and the Interior for natural resources on public lands. The Sikes Act Improvement Act of 1997 requires Department of Defense installations to prepare Integrated Natural Resource Management Plans (INRMPs) that provide for the conservation and rehabilitation of natural resources on military lands consistent with the use of military installations to ensure the readiness of the Armed Forces. INRMPs incorporate, to the maximum extent practicable, ecosystem management principles and provide the landscape necessary to sustain military land uses. While INRMPs are not technically regulatory mechanisms because their implementation is subject to funding availability, they can be an added conservation tool in promoting the recovery of endangered and threatened species on military lands.

On Marine Corps Base Camp Pendleton (MCBCP) in northwest San Diego County, the light-footed clapper rail is indirectly protected through a biological opinion and INRMP. Light-footed clapper rail habitat is protected through a biological opinion on riparian habitats signed in 1995 (USFWS 1995). In 2007, the Marine Corps completed an INRMP, as amended for Camp Pendleton (Marine Corps 2007). The INRMP provides protection for the light-footed clapper rail by incorporating the provisions of the 1995 biological opinion.

Migratory Bird Treaty Act (MBTA): The MBTA and its implementing regulations (50 CFR Parts 20 and 21) directly protect the light-footed clapper rail and their eggs and nests from being killed, taken, captured, or pursued. However, it does not protect habitat except to the extent that habitat alterations would directly kill birds.

The Lacey Act: The Lacey Act (P.L. 97-79), as amended in 16 U.S.C. 3371, makes unlawful the import, export, or transport of any wild animals whether alive or dead taken in violation of any United States or Indian tribal law, treaty, or regulation, as well as the trade of any of these items acquired through violations of foreign law. The Lacey Act further makes unlawful the selling, receiving, acquisition or purchasing of any wild animal, alive or dead. The designation of “wild animal” includes parts, products, eggs, or offspring.

National Wildlife Refuge System Improvement Act of 1997: This Act amends the National Wildlife Refuge System Administration Act of 1966. The Act ensures that the Refuge System is managed as a national system of related lands. It established a strong and singular wildlife conservation mission for the Refuge System and a requirement that the Secretary of the Interior maintain the biological integrity, diversity, and environmental health of the Refuge System. It also provided the Refuge System with a Mission Statement where wildlife needs are placed first. With this mandate the Service has put a priority on recovery actions for the light-footed clapper rail on refuges where they occur.

### Summary of Factor D

The above laws and regulations have greatly reduced the likelihood of the destruction and alteration of coastal wetland habitat. The Act is the primary law that provides protection for this species since it was written in 1973. Other Federal and State regulatory mechanisms provide discretionary protections for the species based on current management direction, but do not guarantee protection for the species absent its status under the Act.

### **FACTOR E: Other Natural or Manmade Factors Affecting Its Continued Existence**

No background information was provided in the original listing rule concerning other natural or manmade factors affecting the species' continued existence (USFWS 1970, p. 16047). Therefore, the following analysis includes information available at the time of listing as well as more recent information.

#### Small Population Size

It is commonly accepted in conservation biology that small populations have higher probabilities of extinction than larger populations because their low numbers make them susceptible to inbreeding, loss of genetic variation, high variability in age and sex ratios, demographic stochasticity, and random naturally occurring events such as wildfires, floods, droughts, or disease epidemics (Shaffer 1981, pp. 131-134; Soulé 1987, pp. 1-189; Meffe and Carroll 1997, pp. 159-233). Allee (1931, pp. 17-50) suggested small, single populations are vulnerable to extirpation when opportunities for reproduction diminish because of reduced opportunity of individuals to find each other (Allee effect or depensation) (Courchamp et al. 2008, pp. vi - 216). Because the majority of light-footed clapper rail populations are small, it is reasonable to consider these smaller populations at risk due to these effects of small population size.

#### Isolation

Another factor commonly understood to make populations vulnerable to stochastic events is isolation. Isolation often acts in concert with small population size to increase the probability of extinction. Isolated populations are more susceptible to long-term/permanent extirpation by accidental or natural catastrophes because the likelihood of recolonization following such events is negatively correlated with the extent of isolation (i.e., colonization is less likely as isolation increases) (Wilcox and Murphy 1985, pp. 879-887; Meffe and Carroll 1997, pp. 285-302). Urbanization and wetland conversion have resulted in a more fragmented range for the light-footed clapper rail such that remaining occupied marsh habitat likely now functions more independently of each other (i.e., are more isolated) where they formerly had other marsh habitat in closer proximity. This increased isolation can increase the susceptibility of light-footed clapper rail populations to extirpation.

#### Automobile Strikes

Death of light-footed clapper rails by automobile strikes has been documented both on major roadways and within lightly travelled wildlife refuge areas (Martin 2000, pers. com.). This

species prefers walking or running and seldom flies, and when it does fly, its flight is slow and labored and appears clumsy when landing (Eddleman and Conway 1998, p. 12). The locomotion characteristics of the light-footed clapper rail likely make this species susceptible to road kill deaths in areas where roads bisect or are near suitable habitat. It is not known if death by road kill is a significant factor affecting the light-footed clapper rail.

### Climate Change

Since listing it has become apparent that there is potential for threats to biota from ongoing accelerated climate changes. We have not yet developed a risk assessment for the light-footed clapper rail to evaluate the relative vulnerability or resilience of these birds or their habitat to impacts associated with climate change. However, this taxon is generally restricted in coastal salt marshes and prefers to nest in the lower marsh areas. Also, many of the marshes currently occupied by light-footed clapper rails are immediately surrounded by urban landscapes with little room to expand if water levels were to rise. Sea level rise due to global climate change will likely be similar at all coastal occurrences of the light-footed clapper rail over the short term. Therefore, changes in tidal flow patterns and timing will likely impact the local distribution and ultimately the local survival of the taxon. Assessment of the occupied coastal marshes using the Service's Sea Level Affecting Marshes Model (SLAMM) will help identify the most vulnerable sites.

### Summary of Factor E

No threats were identified in the 1970 listing rule (USFWS 1970, p. 16047). At the current time, the light-footed clapper rail is threatened with small population size, isolation, automobile strikes, and possible habitat alteration from climate change.

## **III. RECOVERY CRITERIA**

Recovery plans provide guidance to the Service, States, and other partners and interested parties on ways to minimize threats to listed species, and on criteria that may be used to determine when recovery goals are achieved. There are many paths to accomplishing the recovery of a species and recovery may be achieved without fully meeting all recovery plan criteria. For example, one or more criteria may have been exceeded while other criteria may not have been accomplished. In that instance, we may determine that, over all, the threats have been minimized sufficiently, and the species is robust enough, to downlist or delist the species. In other cases, new recovery approaches and/or opportunities unknown at the time the recovery plan was finalized may be more appropriate ways to achieve recovery. Likewise, new information may change the extent that criteria need to be met for recognizing recovery of the species. Overall, recovery is a dynamic process requiring adaptive management, and assessing a species' degree of recovery is likewise an adaptive process that may, or may not, fully follow the guidance provided in a recovery plan. We focus our evaluation of species status in this 5-year review on progress that has been made toward recovery since the species was listed (or since the most recent 5-year review) by eliminating or reducing the threats discussed in the five-factor analysis. In that context, progress towards fulfilling recovery criteria serves to indicate the extent to which threat factors have been reduced or eliminated.

The approved final *Light-footed Clapper Rail Recovery Plan* (USFWS 1985a, p. 22) states:

”The prime objective of the Light-footed Clapper Rail Recovery Plan is to increase the breeding population of LFCR in California to at least 800 pairs by preserving, restoring, and/or creating approximately 4,000 hectares (10,000 acres) of adequately protected, suitably managed wetland habitat consisting of at least 50 percent of marsh vegetation suitable for LFCR in at least 20 marsh complexes. If these levels are obtained, reclassifying the subspecies to threatened status should be considered. Once the subspecies qualifies for threatened status, it may be possible (although at the present this appears unlikely) to devise additional actions that when implemented may warrant considering the light-footed clapper rail for delisting.”

Note: This recovery plan was prepared prior to guidance for writing recovery plans in a threats-based format.

Overall, the population of light-footed clapper rails has increased slightly since it was listed. In the late 1970s it was likely that no more than 300 individual light-footed clapper rails occurred in California (Wilber et al. 1979). When the recovery plan was revised in 1985 the California population of light-footed clapper rails was estimated to be 550 individual birds (USFWS 1985a, p. 14). During the 2007 state census, 443 pairs plus additional unpaired light-footed clapper rails were detected in 19 marshes (Zemba et al. 2007, p. 2). Preliminary data for the 2008 census suggest that population numbers in the two largest populations, Upper Newport Bay and Tijuana Slough NWR, declined approximately 50 percent from 2007 (Zemba pers.com. 2008).

#### IV. SYNTHESIS

Progress has been made to increase the number of light-footed clapper rails since listing, and regulatory mechanisms have been successful for stopping destruction and adverse modification of marsh lands. Conservation efforts have included habitat restoration, installing artificial nesting platforms, captive breeding and translocation, predator control, and annual range wide censuses. However, in its best year since listing, the light-footed clapper rail population was only half way to the 800 pairs suggested by the recovery plan for downlisting. At the current time, small population sizes, isolation, and habitat quality are the predominant factors limiting light-footed clapper rail abundance. The most recent census counts for two of the largest populations decreased by approximately 50 percent from 2007 to 2008. Despite the conservation efforts, the light-footed clapper rail remains endangered. We conclude that the light-footed clapper rail continues to meet the Act’s definition of endangered, and do not recommend a status change at this time.

#### V. RESULTS

##### Recommended Listing Action:

- Downlist to Threatened  
 Uplist to Endangered  
 Delist (indicate reason for delisting according to 50 CFR 424.11):  
      *Extinction*

*Recovery*  
 *Original data for classification in error*  
 No Change

**New Recovery Priority Number and Brief Rationale:** No change.

## VI. RECOMMENDATIONS FOR ACTIONS OVER THE NEXT 5 YEARS

### 1. **Work with partners to help conserve and manage occupied light-footed clapper rail habitat**

Existing occupied habitat should be managed to maintain and, where possible, increase the carrying capacity of each marsh. Management of habitat may include; removing exotic vegetation, water quality control, predator control, restoring tidal influences to marshes which have been closed off, prevent siltation, control pollutants, etc.

### 2. **Consider revising the Recovery Plan to incorporate threats-based recovery criteria and guide conservation actions that reduce threats . Incorporate SLAMM assessments of sea level change.**

### 3. **Identify opportunities through the Service's Partners for Fish and Wildlife and Coastal Programs to promote conservation and restoration of light-footed clapper rail habitat.**

Marshes which include potential habitat but are not currently occupied by light-footed clapper rails should be examined to determine if restoration may increase the value of it's habitat for the species and perhaps extend their range.

### 4. **Protection of light-footed clapper rail occupied marshes in Mexico**

It is believed that the majority of light-footed clapper rails reside in marshes in Mexico. Therefore, the survival of these populations will greatly effect the survival of the species as a whole. Marshes in Mexico should be surveyed to determine the status of the light-footed clapper rail and be protected from development and/or habitat degradation.

### 5. **Continue monitoring of occupied and potential habitat**

Systematic censuses should continue throughout occupied and potentially occupied habitat to adequately track recovery of the light-footed clapper rail. This data will enable for better estimates of occupancy and relative abundance through time. Annual censuses should be initiated for the Mexican populations to gain a more robust knowledge of population numbers throughout the species' entire range.

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U.S. FISH AND WILDLIFE SERVICE  
5-YEAR REVIEW

Light-footed clapper rail (*Rallus longirostris levipes*)

Current Classification: Endangered

Recommendation Resulting from the 5-Year Review:

- Downlist to Threatened  
 Uplist to Endangered  
 Delist  
 No change needed

Appropriate Listing/Reclassification Priority Number: No change

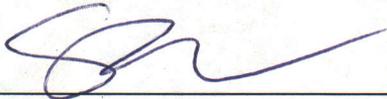
Review Conducted By: Randy Nagel

Date Submitted to Region 8: \_\_\_\_\_

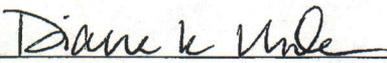
FIELD OFFICE APPROVAL:

**ACTING** Lead Field Supervisor, U.S. Fish and Wildlife Service

AUG 10 2009

Approve  Date \_\_\_\_\_

Ventura Fish and Wildlife Field Supervisor, U.S. Fish and Wildlife Service

Approve  Date 8/10/09