State of California
Natural Resources Agency
Department of Fish and Game
Wildlife Branch

Light-footed Clapper Rail Management, Study, and Propagation in California

2009 Season

By
Richard Zembal, Susan M. Hoffman, John Konecny
Laurie Conrad, Charles Gailband, and Michael Mace

Nongame Wildlife Program, 2010-07

Final Report

To

State of California
Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

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ABSTRACT

The thirtieth annual census of the Light-footed Clapper Rail in California was conducted from the 22nd of February to the 13th of May 2009. Thirty coastal wetlands were surveyed by assessing call counts from Carpinteria Marsh in Santa Barbara County, south to Tijuana Marsh National Wildlife Refuge (NWR) on the Mexican border.

A total of 320 pairs of Light-footed Clapper Rails exhibited breeding behavior in 16 marshes in 2009. This is a 37% increase over the breeding population detected in 2008, but 28% lower than the high count in 2007. Upper Newport Bay with 148 pairs was once again the largest subpopulation in California with 68% more rails exhibiting breeding behavior than in 2008 and only 15% fewer than the high count found in 2005 of 174 pairs. Tijuana Marsh NWR did not recover significantly toward the record high level of 142 pairs in 2007 but did increase from 2008 by 21% to 57 breeding pairs in 2009. The Newport subpopulation comprised 46.3% of the state population in 2009 and the subpopulation in the Tijuana Marsh NWR comprised 17.8%, together accounting for 64.1% of the breeding population of this rail in California.

Ten of the small subpopulations increased in size from the 2008 totals by a combined total of 28 breeding pairs in 2009. The subpopulation in Batiquitos Lagoon reached a new total high of 26 breeding pairs. Three of the smaller subpopulations were reduced by one to nine pairs. Point Mugu increased by 80% to nine pairs and the Seal Beach tally was up slightly to19

[1] Zembal, R., S.M. Hoffman, J. Konecny, L. Conrad, C. Gailband, and M. Mace. 2010. Light-footed Clapper Rail Management, Study, and Propagation in California, 2009. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Program Report, 2010-07. Sacramento, CA 31pp.

pairs. Buena Vista Lagoon had an all-time high count of nine breeding pairs in 2008 and 2009. Excluding the two largest subpopulations, there were three subpopulations in the double figures, ranging from 12 to 26 pairs and totaling 57 breeding pairs or 17.8% of the state total. The remaining 11 subpopulations ranged from one to nine pairs and totaled 58 breeding pairs of clapper rails, or 18.1% of the total.

Additional nesting activity was observed in seven of nine breeding territories at Point Mugu. Incubation nests were found in six territories, chicks were sighted in two territories, and there was evidence of chick feeding in five territories. On the Seal Beach NWR there were 19 clutches of eggs laid on 15 rafts and 28 brood nests were built on 27 rafts. Overall nesting success was 92%. Nest searches at Upper Newport Bay revealed six incubation nests: three were active incubation nests; the eggs in one of those three were infertile; and three were depredated by raccoons, *Procyon lotor*. Four eggs were taken from Newport to augment the captive flock in spite of limited Newport nesting and heavy egg losses to raccoons. At the Kendall-Frost Reserve nine of 16 rafts held nests with 10 clutches of eggs, of which eight hatched. Finally, in Sweetwater Marsh NWR there was no use of the nesting rafts, five new rafts were placed but at least one of three bird pairs nested successfully evidenced by the sighting of chicks with their parents.

Four of six captive pairs laid eggs in 2009. As a result, 42 Clapper Rails were released to the wild, five at Point Mugu, five in the Seal Beach NWR, seven at UC Kendall-Frost Reserve, 16 into San Elijo Lagoon, and nine into Los Penasquitos Lagoon. This brings the total number of rails released to the wild since 2001 to 252.

There were trapping and banding sessions at Upper Newport Bay, Seal Beach NWR, and Tijuana Slough NWR. Two males were captured at Newport, banded and released and the single female captured in Tijuana Marsh was taken into captivity at Sea World. All of the captive-reared rails released to the wild were banded. The annual banding code for 2009 was a gold anodized band on the birds left leg. There were multiple sightings of banded rails, of particular interest were: a breeding female banded in 2007 and sighted with three chicks in 2009 in Los Penasquitos; a rail banded in 2007, probably at Point Mugu sighted in 2009 on the Seal Beach NWR; and another banded rail sighted well above Point Mugu at the Vern Freeman Diversion on the Santa Clara River.

INTRODUCTION

The Light-footed Clapper Rail (*Rallus longirostris levipes*) is a state and federally listed endangered species that is resident in coastal wetlands in southern California and northern Baja, California, Mexico. Loss and degradation of habitat threaten the continued existence of this bird, in spite of ongoing management efforts. The California population of this endangered rail was at a former high of 325 pairs in 15 marshes in 1996, the largest number detected breeding since statewide annual surveys were begun in 1980 until 2004 when 350 pairs were detected in 15 marshes. Since then there were annual increases reaching the record high in 2007 when 443 breeding pairs were detected within the 19 marshes. There was a population crash in 2008 followed by a 37% recovery in 2009 with 320 breeding pairs observed.

One of the first major investigations of this rail identified the lack of suitable nesting habitat as a major, widespread limiting factor (Massey and Zembal 1980). Subsequent work demonstrated the need for emergency actions and recommended management strategies to stem the alarming population decline of this endangered bird in southern California. The actions taken have included: 1) habitat restoration, particularly through enhancement of tidal action to former wetlands; 2) study and control of introduced predators and unnaturally high predator populations; 3) provision of nesting sites in marshes with good habitat but limited options for protected nesting locations; 4) studies that have led to adaptive management strategies, benefiting the rail and the other co-inhabitants of these biologically rich ecosystems; 5) development of a protocol for captive breeding and genetic and demographic augmentation of smaller subpopulations; and 6) surveys of the California population, in part to track the effects of management on annual recruitment.

Implementation of these measures has succeeded in protecting and maintaining most of the small subpopulations and in supporting the expansion of a few. However, the benefits of this attention go far beyond this single species. These endangered birds thrive in our most productive, remaining coastal wetlands. Measures that benefit this rail and its environs enhance conditions for a myriad of other species as well, including people. These places and their wildlife are cherished by hundreds of thousands of southern Californians for their inherent aesthetic, recreational, economic, scientific, educational, and ecological values. Furthermore, there are essential links between the coastal wetlands and vast acres of diverse upland habitats and wildlife located many miles from the coast (Soule et al. 1988, Zembal 1993). Consequently, restoring and maintaining the diversity and vital productivity of the coastal wetlands, while achieving the recovery of the Light-footed Clapper Rail, may only be possible in an environment that includes coastal southern California's complete wildlife heritage.

Hundreds of wetland acres have undergone, or are being planned for restoration. However, full recovery and functionality of coastal wetland habitats may take decades to achieve. In the meantime, habitat suitability for the clapper rail may be quite marginal. All but a few of the current subpopulations of Light-footed Clapper Rails depend upon a marginal habitat

base and are too small to be expected to maintain themselves without management.

Population monitoring and management efforts are essential in stewardship of this critically endangered bird toward recovery. Reported herein are the results of the 2009 survey, management, and propagation efforts for the Light-footed Clapper Rail.

Study Areas

Descriptions of all the marshes recently occupied by Light-footed Clapper Rails are available (U.S. Fish and Wildlife Service 1985 and Zembal and Massey 1981). Three of the current principle study areas are at the Naval Air Station Point Mugu (NASPM, also Point Mugu), the Seal Beach NWR, and Upper Newport Bay State Ecological Reserve.

The marsh at Point Mugu is located in southeastern Ventura County on the 1,821 ha (4,500 acre) NBVC, about 13 km (8 miles) west of the Los Angeles County line. There are 1,012 ha (2,500 acres) of jurisdictional wetlands in Point Mugu (USACOE/EPA 1994), including the largest functioning salt marsh in coastal southern California today. Considering the combined acreages of marshes that are regularly occupied, the vegetated marsh and most closely associated habitats at Mugu Lagoon represent more than 25% of the clapper rail's potential habitat base. The marsh is subject to nearly full tidal action in the central and eastern arms with an amplitude of about nine ft. The tides are dampened by constrictions at Laguna Road and farther west, resulting in a tidal amplitude of only four to five feet. The wetland vegetation is dominated by pickleweed (*Salicornia virginica*) but scattered stands of spiny rush (*Juncus acutus* ssp. *leopoldii*) are critical for rail nest placement.

The Seal Beach NWR covers 369 ha (911 acres) of the 2,024 ha (5,000 acre) Seal Beach Naval Weapons Station in Orange County near the City of Seal Beach. About 299 ha (739 acres) of the refuge lands are subject to regular inundation by the tides. There are about 229 ha (565 acres) of salt marsh vegetation, 24 ha (60 acres) of mudflats that are exposed daily, and 46 ha (114 acres) of channel and open water. The wetlands are fully tidal, with a range of about -0.5 m (1.7 ft) to + 2.2 m (7.2 ft) MLLW, and very productive with a high diversity and abundance of wildlife.

Upper Newport Bay is an Ecological Reserve of the California Department of Fish and Game (CDFG), located approximately 22 km (13.7 mi) down coast of the Seal Beach NWR. Approximately 304 ha (750 acres) are fully tidal, including 105 ha (260 acres) of marsh. The bay is bordered by bluffs, nine - 18 m (30 - 59 ft) high, and surrounded by houses and roads. There are approximately 100 ha (247 acres) of shrublands remaining undeveloped on the edge of the wetlands and two local drainages with some cover along them coursing into the bay.

METHODS

Population Assessment

The thirtieth consecutive annual census of Light-footed Clapper Rails in California was conducted from February 22 through May 13, 2009. Thirty coastal wetlands were surveyed by mapping territorial pairs based on their calls (Zembal and Massey 1981, 1985; Zembal 1992). All of the coastal marshes with known or suspected rail subpopulations were surveyed until an evening or early morning with good calling activity was encountered. Small wetlands with no recent clapper rail sightings that again yielded negative results were surveyed at least twice as were marsh parcels with lower than expected results on the first call count. Additionally, nesting data were considered in the assessment of the subpopulations inhabiting the three wetlands wherein such data were gathered in 2009. A pre-nesting high tide count was accomplished on November 12, 2008 on the Seal Beach NWR followed by a post-nesting high tide count on November 3, 2009. This NWR is the only wetland inhabited by clapper rails that is inundated thoroughly enough during a 6.5 ft. tide or higher to get a relatively complete visual survey of the rails.

In the two marshes with abundant clapper rails, mapping spontaneous calls was the prevalent technique. In marshes with fewer rails and along long, narrow strips of habitat, playbacks of taped "dueting" were used sparingly to elicit responses. In the Tijuana Marsh NWR, enough observers were stationed within potential hearing range of any calling rail to cover the entire marsh on a single evening. However, most of the marshes were surveyed by a single observer visiting discrete patches of habitat on consecutive evenings until all available habitat had been covered. Most of the observations were those of three observers, but primarily the principal investigator. Additional observers participated primarily in three of the year 2009 counts, those at Seal Beach NWR, Tijuana Slough NWR and Sweetwater Marsh NWR.

The more movement required of an observer during a survey, the more likely that breeding, but infrequently calling, rails would be missed. Calling frequency and the detection of calls are influenced by the observer's hearing ability and experience with the calls, the stage of breeding of individual pairs, rail density, and weather conditions (Zembal and Massey 1987). Many surveys attempted on stormy, windy days needed to be repeated. When calling frequency is high with many rounds of calling as adjacent pairs respond to one another, it is possible to map the rails accurately and move on to survey more marsh. However, under usual circumstances approximately 20 ha (50 acres) of marsh can be adequately covered during a single survey.

Surveys are usually conducted in the two hours before dark, but some are done at first light to about two hours after sunrise. In the past, early morning and late evening surveys have been comparable, although evening calling by the rails is more intense and often ends with one or more flurries of intense calling (Zembal et al 1989).

The playback of a taped "clappering" call appears to elicit behavior from the rails as if a living pair is calling nearby. However, work done with Yuma Clapper Rails (*Rallus longirostris yumanensis*) strongly suggests that this closely related species can become conditioned to the tape if it is used excessively (B. Eddleman, pers. comm.). During prime calling times in the evening or early morning, a playback sometimes elicits a single response or a round of calling. However, there are sometimes no vocal responses to the tape occur. If played at a time of day when the rails are not particularly prone to call, the only response likely to be elicited is territorial behavior. Sometimes the response is non-vocal investigation by the pair or one member. Repeated playbacks are likely to elicit aggression. When used only once per year at a given marsh and with minimal repetition, playbacks have yielded important results. Unmated clapper rails, for example, often respond at considerable distances and may approach the tape. Isolated single rails often approach very closely and remain in the vicinity unless displaced.

In assessing the rail population, duets and some single "clapperings" were treated as territories. Since advertising singles are not indicative of an occupied territory with reproductive potential at the time of the survey, they are not included in the population total. However, a single “clappering” is as good an indicator of a territory as a duet, when advertising is not heard later from the same territory because during a two to four hour census period, pairs often dueted from territories where only single pair members had called earlier. However, the fewer rails in a marsh, the more important it is to count only duets as pairs to avoid over-estimating the breeding subpopulation.

The 2009 call counts were conducted on 27 days and totaled approximately 312 field-hours.

Management and Monitoring of Nesting Sites

Fleischer et al (1995) documented low genetic variability in Light-footed Clapper Rails and recommended translocations from larger to small subpopulations for the inherent genetic and demographic benefits. We are still vigilant for potential translocation opportunities with eggs but have mostly used captive-bred juveniles in recent years (see below).

A review of the literature and examination of the feasibility of translocation was completed for this rail (Hoffman 1995). A maximum of nine males and six females were proposed in that study for translocation from Newport to Seal Beach NWR. This is a lower number than usually proposed for translocation but might represent a reasonable approach, given the rarity of this rail. In 1997, for example 15 rails equaled 5% of the breeding population at Upper Newport Bay (Table 1). Moving 15 adult rails from Newport to each of the five marshes represents moving 25% of this largest subpopulation. That is more birds than should be moved in a single year. We proposed to move fewer, up to 10 rails each to as many of the target marshes as possible each year. It should be noted that there is some precedence for positive results, even with very low numbers of relocated birds. For example, translocations of Red-cockaded Woodpeckers (*Picoides borealis*) have involved only one to four birds and resulted in successful breeding and recruitment (Allen et al. 1993).

Potential egg translocations necessitated nest searching and monitoring at Upper Newport Bay and the five marshes to potentially receive eggs. Nest searches and observations were begun in February and continued into July 2009. The activities were conducted as they have been in the past (Massey and Zembal 1980, Massey et al. 1984). Extreme care was taken to minimize visitation and disturbance.

Nest searches at two of the six wetlands potentially involved in translocations were focused mostly on the artificial nesting rafts deployed in them for the rails. Three other wetlands used to have rafts deployed, maintained, and monitored annually in each but the efforts were abandoned because of low use. Point Mugu was one such marsh; 25 floatable rafts were deployed there in 1988. However, there was never any evidence that the rails used the rafts until recently (see below). Although many marshes occupied by rails suffer from a poor supply of good nesting sites, artificial nesting rafts have been used by the birds in only four of seven marshes where they have been installed. Those four and the number of rafts in each during the 2009 season were Point Mugu with 10 rafts (five of which were installed in May, 2009), the Seal Beach NWR with 87 rafts, Kendall-Frost Reserve with 16 rafts, and Sweetwater Marsh NWR with five rafts. The rafts in Kendall-Frost and Seal Beach were refurbished in February and early March and visited approximately every three weeks during the breeding season into July. The rafts at Point Mugu and Sweetwater NWR were visited five and two times, respectively. Raft maintenance and monitoring involved a minimum of 281 field-hours.

A new nest raft design and cover were deployed in 2008 and 2009. The raft looks like a small palette measuring 33 in X 24 in. The top is made of four 1in X 6 in pine boards and the sides and two bottom slats are of 1 in X 3 in boards fastened perpendicular to the top and forming three compartments on the underside of the raft that hold Styrofoam for flotation. The raft is anchored in the marsh by ¾ in pvc fastened to the middle of the long sides and extending 62 in from each side to a cross bar of pvc that is anchored with two 70 in long pieces of 3/8 in rebar driven at an angle into the mud. The covers were woven willows and reeds or constructed of a pvc and wire cage covered in quack grass. The cover was fastened with wood screws and plastic ties. This new design eliminates the upright dowels, potential raptor perching thereon, and renders the rafts less conspicuous in the marsh.

Nest searches and monitoring were focused at Upper Newport Bay, Point Mugu, Seal Beach NWR, Kendall-Frost Reserve, and there were three searches in Tijuana Slough NWR in 2009. At Upper Newport Bay seven field days performed in the months of March through June by four observers resulted in a total of 84 field-hours of nest searching and observation. There were 12 dates at Point Mugu by one to eight participants and 184 field-hours. On the Seal Beach NWR two to five observers accumulated 160 field-hours over 20 days. There were 54 field-hours spent at the Kendall-Frost Reserve by one to 22 observers over five days. Lastly, in Tijuana Slough one to 14 observers expended 59 field-hours nest searching over three days. The nesting and other bird activities at Sweetwater Marsh, the Chula Vista Nature Center, Sea World, and the Wild Animal Park were monitored daily by one to seven observers totaling in hundreds of hours.

Development of a Protocol for Captive Breeding

A wetland aviary was developed at the Chula Vista Nature Center (CVNC or Chula Vista), adjacent to the Sweetwater Marsh NWR to house Clapper Rails and develop a protocol for breeding (Bayfront Conservancy Trust 1995). The first pair of rails was taken into the facility in December 1998. The second pair was taken into captivity in November 2000 and young Light-footed Clapper Rails were produced in captivity for the first time in 2001. Any eggs produced by these captive rails were to be used in the egg translocation efforts or hatched and reared in captivity, preferably by the parents and released into Point Mugu. However, because 28 of 60 captive-reared and released rails had been from one breeding pair, 2001 – 2003, care had to be taken not to genetically swamp the Mugu rails. Consequently, there were four other marshes where captive-reared young could be released initially and five more that were added in 2004 and 2005 (Zembal et al. 2005).

There were six potential breeding pairs in captivity in 2009, two pairs at each of the three facilities. The CVNC housed rails #208/052 and 219/217; Sea World held #089/218 and 359/366 (formerly 155/091); and the Wild Animal Park kept #206/209 and 207/246. The male #208 was banded 103544891 (L) at Newport on October 8, 2005 and mated with female #052 captured from Newport on September 20, 2002. The pair 219/217 were hatched at Sea World on May 23 and 15, 2006, respectively from eggs taken from two different nests at Upper Newport Bay. The male #089 was hatched at Sea World on June 3, 2003 from a Newport egg and mated to #218, a Sea World hatchling on May 22, 2006 from an egg taken from Newport. The pair #155/091 were hatched at Sea World on June 13, 2004 and June 5, 2003, respectively from Newport eggs; 155 was retired on August 5 and 091 was found dead on March 26. The male 359 was hatched from a Newport egg at Sea World on June 19; the female 366 was trapped from Tijuana Estuary on October 5. The male #206 was taken from Newport on September 18, 2005 and mated to #209, another Newport capture from November 29, 2005. The male #207 was trapped from Newport on September 19, 2005 and mated to #197 from a Newport egg hatched at Sea World on May 19, 2005. The female #197 was the only casualty during fire evacuation at the Wild Animal Park and was replaced with a female # 246 captured at Upper Newport Bay on November 25, 2007 and banded #103544924.

We attempt to mix the genetic stock of the captive breeders by adding new rails hatched from Newport eggs collected annually when possible. Sometimes adults are trapped from Newport and added to the captive flock. In 2009 reproduction was mediocre in Newport and depredation by raccoons was still a major issue. Even so, on June 8, four eggs were taken into captivity by removing two eggs from two Newport nests. They were incubated and hatched at Sea World.

Rail chicks that are hand-reared at Sea World are transferred from the hatcher to a brooder box in which the temperature is maintained at 88 – 90° F for the first week, and then gradually decreased to ambient. A recording of outdoor marsh sounds was played in the background. Chicks are fed with a puppet to avoid imprinting. Food items include finely cut lettuce, cricket abdomens, graduating to whole live crickets. As the chicks grow diets change to guppies, herring filets, pieces

of capelin without bones or scales, krill with tails and heads removed, live meal worms and wax worms with heads removed, live black and red worms, pinkies, mussels, and "rail mix". Rail mix was composed of Mazuri waterfowl starter, soaked dry dog food, and hard-boiled eggs. Food items were sprinkled with vitamins and fed hourly. As the chicks grew, the commercial diet was phased out and replaced with live foods plus thawed frozen fish and krill. At eight to ten days old the chicks were moved from the brooder boxes to the indoor runs. The runs were lined with dirt and planted with plenty of cover. At one month the young rails were moved to the "conditioning" pens at the Nature Center to prepare for release into the wild. The Sea World diet and protocol was appended to the 2005 annual clapper rail report (Zembal et al. 2005); there were refinements made to the protocol again in 2009.

In 2009, one to four observers monitored the captive rails from several minutes to many hours daily at the Chula Vista Nature Center, Sea World, and Wild Animal Park. Forty thousand visitors were given the opportunity to view the rails at Chula Vista, hear about their plight, and the importance of their ecosystem. The rails at Sea World were incorporated into the educational program curriculum there in 2007 and approximately 15,000 students observed and studied them; the rails at the Wild Animal Park have been isolated from visitor contact as were the Sea World rails in 2008 and 2009.

Banding and Telemetry

Trapping and banding sessions were conducted at Seal Beach NWR, Upper Newport Bay, and Tijuana Marsh in 2009. In the Seal Beach NWR eight participants deployed 20 traps for three hours on October 7. At Newport, eight participants monitored 18 traps for three hours on October 6. In Tijuana Slough on October 5, seven biologists monitored 18 traps for three hours. The primary purpose for trapping at Newport has been to refresh the captive flock. Preferably, old breeders are replaced with young raised from wild eggs, alleviating the need for trapping.

All of the 42 Clapper Rails raised in captivity and released to the wild in 2009 were banded (see Zembal and Massey 1983 for a full discussion of trapping and banding techniques). Five rails were put into Point Mugu on August 25; five into Seal Beach NWR on August 25; 16 into San Elijo Lagoon on June 16; nine into Los Penasquitos on July 22; and seven into Kendall-Frost Reserve on October 27. The annual code for 2009 was an anodized gold metal band on the left leg; the Service band was placed on the right leg. USFWS band numbers on the rails released to Point Mugu were #1065-39860 – 1065-39862 and 1065-39867-868; into the Seal Beach NWR were #1065-39863 – 1065-39866 and 1065-39869; to San Elijo Lagoon were # 1065-39835 – 1065-39850; into Los Penasquitos Lagoon were #1065-39851 – 1065-39859; and into Kendall-Frost Reserve were #1065-39873 – 1065-39878 and #1035-44881. Two males were captured in Upper Newport Bay, banded only with Service bands #1065-39871 – 1065-39872, and immediately released at the points of their captures. A single female was captured in the Tijuana Marsh, banded only with Service band #1065-39870 and taken into captivity at Sea World (Acquisition LFCR 366).

RESULTS and DISCUSSION

A total of 320 pairs of Light-footed Clapper Rails exhibited breeding behavior in 16 marshes in 2009 (Table 1). This is a 37% increase over the breeding population detected in 2008, but 28% lower than the high count found in 2007. The state total has been smaller than in 2009 in 24 of the 30 years on record. The subpopulation in Upper Newport Bay was once again the largest in California up by 68% from the crash in 2008 but lower by 15% than the record year in 2007. The Tijuana Marsh NWR subpopulation recovered slightly from the low in 2008 with an increase of 21% to 57 nesting pairs but well below the record level of 142 pairs in 2007. The Newport subpopulation comprised 46.3% of the state total in 2009 and the Tijuana Marsh NWR subpopulation comprised 17.8%, together accounting for 64.1% of the breeding population of the Light-footed Clapper Rail in California. In addition, five marshes held nine to 26 pairs each for a combined total of 75 pairs or 23.4% of the state total.

The drought continued through the spring of 2009. Vocalizing was stronger than in 2008 but was still weaker than in the past. As in several recent years, particularly in 2008, many surveys were re-scheduled due to poor calling activity in 2009. Calling from many sites was poor during each of several visits.

Six egg nests were found in 2009 in Upper Newport Bay compared to two egg nests in 2008. Nests were examined in the same areas as former years by four observers over seven field-days and 84 field-hours. One of the two 2008 nests was depredated, the other was still active on July 17 which is later than the last re-nest date in usual years. In 2009, three of six egg nests were depredated and the eggs were not viable in a fourth. In 2007 intensive nest searches over 17 days, perhaps 100 acres, and 300 field-hours revealed only six incubation nests, four of which were depredated in the same areas that in 2006 held 24 nests, 12 of which were active egg nests when discovered. Nesting activity and hatching results have gravely deteriorated recently in Upper Newport Bay. There are raccoon (*Procyon lotor*) signs well out into the marsh, spanning the Bay. There was also evidence of stirring of sediments, habitat disturbance, and noise associated with the ongoing dredging activity. How this subpopulation rebounded and is maintaining its numbers is not clear.

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2009.

Part I: 1980 – 1989

Location	Number of Pairs Detected In:									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Santa Barbara County										
Goleta Slough	0	0	-	0	-	-	-	-	0	0
Carpinteria Marsh	16	14	20	18	26	7	4	5#	2#	0
Ventura County										
Ventura River Mouth	-	-	0	0	-	-	-	-	-	0
Santa Clara River Mouth	-	-	0	-	-	-	-	-	-	0
Mugu Lagoon	-	0	-	1	3	7	6	7#	7#	5

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2009.
(continued) **Part I: 1980 – 1989**

Location	Number of Pairs Detected In:									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Los Angeles County										
Whittier Narrows Marsh	-	-	-	*	0	-	-	-	-	0
Orange County										
Seal Beach NWR	30	19	28	20	24	11	5	7	14	6#
Bolsa Chica	0	0	0	0	-	-	-	*	0	0*
Huntington Beach Wetlands	-	0	-	-	-	-	0	0	0	0
Upper Newport Bay	98	66	103	112	112	87	99	119	116	116
San Joaquin Reserve	-	-	5	4	1	2	1	0	0	0
Carlson Rd Marsh	-	-	5	4	2	0	0	1#	0	0
San Diego County										
San Mateo Creek Mouth	-	-	0	0	-	-	0	-	0	0
Las Pulgas Canyon Mouth	-	-	0	0	0	-	-	-	-	0
Las Flores Marsh	-	-	0	0	0	-	0	-	0	0
French Canyon Mouth	-	-	-	0	0	-	-	-	-	0
Cocklebur Canyon Mouth	-	-	1	0	0	-	-	0	0	0
Santa Margarita Lagoon	0	0	2	1	2	1	1	1	1	0
San Luis Rey River Mouth	-	-	0	0	-	-	0	0	0	0
Guajome Lake Marsh	-	-	0	1	2	0	0	0	0	0
Buena Vista Lagoon	0	0	0	*	0	-	-	-	0	0
Agua Hedionda Lagoon	1	2	1	7	6	1	0	0	0	0
Batiquitos Lagoon	0	0	0	0	0	-	-	-	-	0
San Elijo Lagoon	-	5a	4	4	10	1	0	2	5#	7#
San Dieguito Lagoon	-	-	-	-	-	-	-	*	0	0
Los Penasquitos Lagoon	-	0	-	0	0	-	0	-	1a#	0
Kendall-Frost Reserve	18	16	6	20	24	17	12	6a#	4a#	4#
San Diego River	-	3	1	2	2	1	0	0	1a#	0#
Paradise Creek Marsh	1	2	3	1	1	0	0	0	0	0
Sweetwater Marsh	4	5	7	6	14	3	9	5a#	5	5#
E Street Marsh	3	1	3	3	2	2	2	0a	1#	0
F Street Marsh	-	1	1	0	1	0	0	0	0	0
J Street Marsh	-	1	0	0	-	-	0	0	0	0
Otay River Mouth	3	4	5	3	5	1	1	0	0	0
South Bay Marine Reserve	3	3	1	1	2	1	1a	2#	5	5#
Dairymart Ponds	-	-	-	-	-	-	0	*	1a	0#
Tijuana Marsh NWR	26	31	25	41	38	0	2	23a#	14a#	15a#
Total: pairs	203	173	221	249	277	142	143	178	177	163
marshes	11	15	18	18	19	14	12	11	14	8

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2009.
(continued) **Part II: 1990 – 1999**

Location	Number of Pairs Detected In:									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Santa Barbara County										
Goleta Slough	0	0	0	0	-	-	0	0	-	-
Carpinteria Marsh	0	0	0	0#	0	2#	3#	5#	3#	2#
Ventura County										
Ventura River Mouth	0	0	0	0	0	0	0	-	0	-
Santa Clara River Mouth	0	0	0	0	0	0	0	-	0	-
Mugu Lagoon	6#	4#	5#	5	6#	5#	3#	4#	4#	4#
Los Angeles County										
Whittier Narrows Marsh	-	-	-	0	0	-	0	0	-	-
Orange County										
Seal Beach NWR	16	28	36	65	66	51#	52#	37#	16#	15#
Bolsa Chica	0#	0*	0#	0#	0*	0*	0*	0*	0*	0
Huntington Beach Wetlands	0	0	0	0	0	0	0	0	0	-
Upper Newport Bay	131	128	136	142	129	117	158	149#	105#	104#
San Joaquin Reserve	0	0	0#	0	0	0	0	0	-	0
Carlson Rd Marsh	0	0	0	0	0	0	0	0	-	0#?
San Diego County										
San Mateo Creek Mouth	0	0	0	0	0	0	0	-	-	-
Las Flores Marsh	0	0	0	0	0	0	0	-	-	-
Cocklebur Canyon Mouth	0	0	0	0	0	0	0	0	0	0
Santa Margarita Lagoon	0	0	0	0#	0	0	0	0#	0	0
San Luis Rey River Mouth	0#	0	1	0	-	0	0	0	0	0
Guajome Lake Marsh	0	0	0	0	-	0	0	0	-	-
Buena Vista Lagoon	0a#	2#	5	2#	3#	1#	6#	7#	4	5#
Agua Hedionda Lagoon	0	0	0	0	0	0	0	1?	1	0
Batiquitos Lagoon	0#	0#	0	1#	1#	0#	2	2	1	3
San Elijo Lagoon	5#	5	4#	6#	1#	3#	3#	8	3#	5#
San Dieguito Lagoon	0	0	0	0	0	0	0	0	0	-
Los Penasquitos Lagoon	0	0#	0#	0#	1	1	1	2	2#	2
Kendall-Frost Reserve	5#	9	11	5#	5#	4#	1#	2	2	4#
San Diego River	2	5	1a	5	5#	6b	5	5#	4	3
Paradise Creek Marsh	0	0	1a	0a	0	1	2	0	0	0
Sweetwater Marsh	2#	4a	4a	3a	7#	7	8	3#	4	3
E Street Marsh	0	1a	1a	1	0#	2	1	1	1	2
F Street Marsh	0	0	0	0	0	0	0	0	1	0
J Street Marsh	0	0	0	0	0	0	0	0	0	0
Otay River Mouth	0	0	0	0	0	1	3	3	2	1
South Bay Marine Reserve	5	2	3a	1	0	0	0	1#	1	0
Dairymart Ponds	0a#	0#?	0#	1a	0	-	-	-	-	-
Tijuana Marsh NWR	17a#	47a	67a	63a	64	61	77	77#	68#	80#

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2009.
(continued) **Part II: 1990 – 1999**

		Number of Pairs Detected In:									
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total:	pairs	189	235	275	300	288	262	325	307	222	233
	marshes	9	11	13	13	11	14	15	16	17	14

- indicates that no census was taken.
* indicates a fall or winter occurrence.
# indicates the detection of unpaired rails (used beginning in 1987).
a Paul Jorgensen Unpublished data; b 2 pairs are in Famosa Slough.

Table 1. Census of the Light-footed Clapper Rail in California, 1980 – 2009.
(continued) **Part III: 2000 – 2009**.

Location	Number of Pairs Detected In:									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Santa Barbara County										
Goleta Slough	-	0	0	0	-	-	-	-	0	0
Carpinteria Marsh	1#	1#	2	0#	0#	0	0	0	0	0
Ventura County										
Ventura River Mouth	-	-	0	0	-	-	-	-	0	-
Santa Clara River Mouth	-	-	0	0	-	-	-	-	0	-
Mugu Lagoon	7#	7#	10#	14#	19#	14#	17#	15#	5#	9#
Los Angeles County										
Whittier Narrows Marsh	-	-	0	-	-	-	-	0	-	0
Orange County										
Seal Beach NWR	10#	11#	24#	23#	16#	15#	21#	24#	17#	19#
Bolsa Chica	0	0	0*	0	0	0	*	*	*	*
Huntington Beach Wetlands	-	0	0	0	0	0	4#	4	1#	5#
Upper Newport Bay	150#	124#	129#	144#	165#	174#	158#	165#	88#	148#
San Joaquin Reserve	0	0	0	0	-	0	0	0	*	0
Carlson Rd Marsh	0#	0	0	0	-	0	0	0	0	0
San Diego County										
San Mateo Creek Mouth	0	0	0	0	0	-	-	-	0	-
Las Flores Marsh	0	0	0	0	0	-	-	-	0	-
Cocklebur Canyon Mouth	0	0	0	0	0	-	-	-	0	-
Santa Margarita Lagoon	0	0	1	2	1	2	1	1	1#	-
San Luis Rey River Mouth	0	0	0	0	0	0	0	0	0	0
Guajome Lake Marsh	0	-	-	0	-	-	0	0	0	-
Buena Vista Lagoon	5#	3#	6#	5#	5#	6#	8#	8#	9#	9#
Agua Hedionda Lagoon	2	2	1	4	5	4#	7#	4	7	6
Batiquitos Lagoon	2#	3#	3#	5	11	16#	19#	22	22	26#
San Elijo Lagoon	1#	1#	2	7#	7#	6#	15#	12#	5#	8
San Dieguito Lagoon	0#	0#	0	0#	6	12#	31#	15#	21#	12#
Los Penasquitos Lagoon	1	1	2	1#	2#	2	7#	12#	2#	4#
Kendall-Frost Reserve	4	4	5#	6#	14	14	5#	4#	2#	7

Table 1. Census of the Light-footed Clapper Rail in California, 1980 – 2009.
(continued) **Part III: 2000 – 2009**.

Location	Number of Pairs Detected In:									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
San Diego River	3#	4	6	6#	8#	5	4	6	4#	3
Paradise Creek Marsh	0	0	0	0	0	0	0	0	0	-
Sweetwater Marsh	2	3#	3#	1#	3#	1	4#	4#	3	5
E Street Marsh	2	0	1	1	0	0	2	1	0	0
F Street Marsh	0	0	0	0	0	0	0	0	0	0
J Street Marsh	1	0	0	1	0	0	0	0	0	0
Otay River Mouth	1	1	1	0	0	1	2	1	0	1
South Bay Marine Reserve	0	0	0	0	0	0	1	2	0	1
Dairymart Ponds	-	-	-	2	1	1	0	1	-	0
Tijuana Marsh NWR	61#	52#	78#	64#	87	87#	102#	142#	47#	57#
Total: pairs	253	217	274	286	350	360	408	443	234	320
marshes	16	14	16	16	15	16	18	19	15	16

- indicates that no census was taken.
* indicates a fall or winter occurrence.
# indicates the detection of unpaired rails (used beginning in 1987).

Tijuana Marsh's subpopulation was 87 pairs strong for two consecutive years prior to the 2006 high count of 102 breeding pairs, followed by an even higher record count of 142 pairs in 2007. That 40-pair increase in 2007 was never seen at any marsh except Upper Newport Bay; the 95 pair decrease in 2008 was simply unprecedented. This subpopulation had not been that small since 1991. The 10 pair increase in 2009 is better than the alternative but still renders this subpopulation smaller than during seven of the nine counts since 2000.

The rails increased gradually in Batiquitos Lagoon as the ecological functionality of the wetland continued to improve over time following the major restoration project implemented there in December 1996. The lagoon has remained tidal and rail habitat has been increasing and improving. Breeding rails were detected on the north side of the lagoon for the first time in 2004 and a total of 11 pairs were detected. Clapper Rail numbers grew to 22 pairs in 2007 and 2008 and Batiquitos Lagoon was the third largest subpopulation in the state in 2008. Then, in 2009, a new high of 26 pairs was reached. In 2009 there were seven breeding pairs vocalizing from habitat adjacent to the western tern island; six pairs along the north edge of the inner lagoon; 12 pairs along the southern edge; and a single pair again in the northeast corner of the basin just west of the freeway. The cordgrass in the west basin is extensive and looks vigorous, although much of it appears to be regularly over-washed. Finally, there was a single response to the tape from freshwater reeds on the southeast creek at Levante and El Camino Real.

The subpopulation of Light-footed Clapper Rail newly discovered in the San Dieguito River Valley in 2004, inland of the lagoon and El Camino Real, was first reported to be

comprised of only six breeding pairs. That population estimate was probably low due to the lateness of the census and in 2005 there was evidence of at least 12 pairs, although this too was a conservative estimate. Finally in 2006, there was abundant calling indicative of at least 31 breeding pairs. This ranked San Dieguito as the third largest subpopulation of Light-footed Clapper Rails in 2006 and the largest ever reported in a freshwater marsh system. Calling was poor in 2007 when only 15 pairs were detected, but slightly better in 2008 resulting in a count of 21 pairs. Calling was the poorest yet in 2009 when the population estimate was only 12 pairs along with 13 advertising males. Additional Clapper Rail detections were reported from the San Dieguito Creek Watershed in 2009 along Lusardi Creek, the pond at 4S Ranch Community Park on Dove Creek Road, and at 4 Gee Road just north of Camino Del Sur.

The Seal Beach NWR subpopulation had been more than 20 pairs for several consecutive years up to 2007, based upon call counts augmented by raft nesting data. In 2008, the count was lower by seven pairs. Calling during the evening of the census was limited; therefore, the population estimate was based upon the nesting activity on the rafts. In 2009, the estimate is back up to 19 pairs based again, mostly upon nesting activity. With so much marsh available to the rails, a much larger breeding population is expected. Raptor predation is suspected to be limiting rail survival and raptor monitoring sessions have been reinitiated; high tide counts have also continued. Seal Beach is the only marsh currently occupied by Light-footed Clapper Rails that gets fully inundated during a high tide of about 6.5 ft (MLLW), or higher which would render the rails vulnerable due to reduced cover. Tides of this height occur regularly in the late summer usually in darkness and in the fall and winter in the early morning. The rails are forced onto debris or to the edge of the marsh near busy roads and where there is little cover exposing the rails to potential predation and vehicle collision. However, the completeness of inundation also allows fairly dependable surveying of the subpopulation outside of the breeding season. Accordingly, the rails were counted again from canoes before and after the 2009 breeding season; an attempted post-breeding high tide count was fogged out on November 3 and 50 rails were counted on December 1. The pre-nesting count was on 12 November 2008 and 20 individuals were sighted (Table 2).

Table 2. High Tide and Call Counts of Clapper Rails on the Seal Beach National Wildlife Refuge, 1975 - 2009.

Date	Tidal Height	Clapper Rails Counted	Breeding Pair Members Before	After	Notes
2 Dec 1975	7.0	22	-	-	
31 Dec 1975	6.7	12	-	-	
21 Nov 1976	7.1	24	-	-	
20 Dec 1976	7.1	35	-	-	
21 Dec 1976	7.0	34	-	-	
10 Dec 1977	7.1	16	-	-	
11 Dec 1977	7.1	40	-	-	
18 Jun 1978	6.8	16	-	42	+6 youngsters

Table 2. High Tide and Call Counts of Clapper Rails on the Seal Beach National Wildlife Refuge, 1975 – 2009 (continued).

Date	Tidal Height	Clapper Rails Counted	Breeding Pair Members Before	Breeding Pair Members After	Notes
30 Nov 1978	6.7	38	-	42	
1 Dec 1978	6.7	32	-	42	
3 Sep 1979	6.4	20	42	60	Tide too low
3 Nov 1979	6.6	56	42	60	
2 Dec 1979	6.7	32	42	60	
3 Dec 1979	6.7	44	42	60	
21 Nov 1980	6.9	55	60	38	First red fox den found
29 Jun 1981	7.0	34	60	38	Tide too late, dark
12 Nov 1981	6.9	43	38	56	
29 Dec 1982	7.0	23	56	40	
18 Jan 1984	6.9	23	40	48	
21 Nov 1984	6.7	5	48	22	+ 7 red foxes
13 Nov 1985	7.1	2	22	10	+ 2 red foxes
12 Dec 1985	7.2	2	22	10	+ 2 red foxes
22 Nov 1988	6.9	6	28	12	128 red foxes removed in ‘88
16 Oct 1989	6.9	59	12	32	Record High Tide Count; 25 red foxes removed in 1989
5 Oct 1990	6.4	57	32	56	Tide too low
2 Nov 1990	6.8	69	32	56	Record High Tide Count
22 Nov 1991	6.9	98	56	72	Highest Population Total
26 Oct 1992	6.8	159	72	130	Highest Population Total
15 Oct 1993	6.8	143	130	132	Highest Population Total
4 Nov 1994	7.0	150	132	102	220 Red-tailed Hawks counted On the NWS on 11 December 1994
25 Oct 1995	6.5	53	102	104	Tide too low
22 Nov 1995	6.9	55	102	104	
10 Dec 1996	6.7	55	104	74	
17 Oct 1997	6.6	40	74	32	
30 Dec 1986	7.2	7	10	14	Begin red fox trapping, 59 foxes removed in 1986
28 Jan 1987	7.0	7	10	14	63 red foxes removed in 1987
8 Aug 1987	7.3	8	14	14	Tide too late, dark
22 Nov 1987	6.7	12	14	28	
21 Dec 1987	7.0	8	14	28	+ 2 red foxes
16 Feb 1988	6.8	10	14	28	
04 Nov 1998	6.8	30	32	30	
23 Nov 1999	7.0	17	30	20	
11 Dec 2000	6.9	30	20	22	
15 Nov 2001	6.7	35	22	48	
04 Dec 2002	7.1	62	48	46	
26 Oct 2003	6.7	96	46	32	
12 Nov 2004	6.7	52	32	30	

Table 2. High Tide and Call Counts of Clapper Rails on the Seal Beach National Wildlife Refuge, 1975 – 2009 (continued).

Date	Tidal Height	Clapper Rails Counted	Breeding Pair Members Before	After	Notes
15 Nov 2005	6.7	57	30	42	
09 Oct 2006	6.6	103	42	48	
06 Nov 2006	7.0	95	42	48	
26 Oct 2007	7.1	32	48	34	
12 Nov 2008	6.9	20	34	38	
01 Dec 2009	6.8	50	38	-	Fogged out on Nov 3

The post-season tide count in 2008 was the lowest total since 1999 and did not bode well for the 2009 breeding season which turned out to be the status quo. Some of the rails must have already moved undetected and uncounted into the marsh edges during the 2008 count. The post-nesting count of 50 rails bodes well for the 2010 nesting season. Potential rail predators were out in abundance during the counts, hunting the marsh and edges, including Red-tailed Hawks (*Buteo jamaicensis*), Northern Harriers (*Circus cyaneus*), Peregrine Falcon (*Falco peregrinus*), Cooper's hawk (*Accipiter* cooperi) and American kestrels (*Falco sparverius*). Continued upgrading and maintenance of the artificial rafts on the Seal Beach NWR is essential to the protection of the wintering rails and success of the breeding rails. Usually, at least half of the rails counted during the winter high-tide counts have been safely hidden on rafts.

Counts in Buena Vista Lagoon in 2008 and 2009 indicated that this wetland's former high count of eight pairs had been exceeded by one in both years. Totals of six pairs, five singles (three determined to be paired by the lack of advertising; two might have been paired or unmated males), and three males were detected in 2009. Of these, one pair was in the central lagoon, five were in the inner lagoon, and there were two pairs detected in the little outer lagoon between the coast route and the railroad. There are many management issues at this little freshwater marsh shared with most of the other coastal wetlands, including abundant non-native trees (some of which were being culled) and shrubs that harbor perching predators and homeless humans. The trash and trailing associated with the homeless camp off State Street near Laguna Drive were particularly bad.

The marsh at Agua Hedionda Lagoon has held a maximum of seven pairs of Light-footed Clapper Rails, once in 1983 and again in 2006. The population was down to four pairs in 2007, back up to seven pairs in 2008 and at six pairs in 2009. The brackish marsh inland of the inner lagoon was greatly impacted by a change in drainage in the mid-1980s and the rails were barely detectable through the 1990s. The five pairs located in 2004 was the highest level observed since then and this level was probably sustained in 2005 when four pairs and an advertising female were detected during an early season count. Given the usual presence of unmated males in Agua Hedionda, the female likely found a mate and bred. With the recently increased street runoff from adjacent housing, the main freshwater marsh has rejuvenated to some extent, perhaps to the

benefit of the rails as evidenced by the record number in 2006 and again in 2008. Five captive-bred rails were released into Agua Hedionda Lagoon in 2004 on the inland edge of the inner lagoon, but none have been re-sighted since. However, for the first time since the release, a pair and a single rail were vocalizing from the salt marsh in the vicinity of the release site in 2009.

Since doubling in size between 2001 and 2003, the Point Mugu subpopulation fluctuated between 14 and 19 pairs, 2003 - 2007. This subpopulation fluctuated between three and seven pairs for nearly 20 years until recent augmentations fostered its growth. There was a crash in 2008 back down to five pairs, but the population increased to nine pairs in 2009. There is an efficient predator management program in place, consistent rail and marsh management, and the Clapper Rails are still breeding; nevertheless, this subpopulation is not as large as would be hoped for in this, the biggest contiguous patch of potential habitat in the state. There was no breeding detected in the eastern arm of the lagoon. All of the 2009 breeding activity occurred in the marsh from the runway to the vicinity of LeMar Balls.

The year 2009 was another of intermittent vocalizing activity at Point Mugu. Between April 3 and June 26 approximately 150 hours of systematic field observations were accrued, by one to four observers, both in the early morning and late afternoon. During these observations "kecking" was the most common rail vocalization heard. Seven dueting pairs were recorded from seven locations; many single "clapperings" from four locations (the evidence at two of these locations was too weak to determine breeding); and many incidents of "kecking" from several locations, but mostly from four of them. Four egg nests were found in 2009; there was at least a partial hatch of all four.

There have been occasional re-sightings of banded rails at Point Mugu, indicating that some of the captive-bred rails remained local after being released into the marsh. In 2008, for example Martin Ruane re-sighted a banded rail four days after its release on August 22 near the release site. However, at least one banded rail, a female banded 1035-8878 did not stay at Point Mugu. A photograph was taken of this rail at Upper Newport Bay on December 12, 2004 by Steve Metz. This female was captive-bred at the Chula Vista Nature Center and released into the eastern arm of Point Mugu on August 28, 2004, 106 days before her picture was taken at Newport. This shatters the old long-distance movement of 13.5 miles recorded for the subspecies *levipes* (Zembal et al. 1983). The distance from Point Mugu to Upper Newport Bay is approximately 90 miles along the coast. This indicates that at least one and probably others of the captive-bred rails are more prone to movements between marshes than was previously observed in wild birds. It also indicates that at least one of the released rails chose not to stay at Point Mugu. We speculated that others may have behaved similarly and in 2010 three Clapper Rails were sighted on the Santa Clara River at the Vern Freeman Diversion Dam; at least one of these rails was banded.

The San Elijo Lagoon subpopulation was at its fourth highest level in 2009 with eight pairs of breeding Clapper Rails. Although San Elijo Lagoon has had major efforts to restore

tidal function, the lagoon still closes to the ocean with regularity. All of the paired rails were found in fresh water marsh growth along the lagoon edges, seven pairs in the east basin and only one in the Central Basin. The only rails detected on Escondido Creek were advertising males. San Elijo received an augmentation of eight captive-bred rails in 2004, five in 2006, four in 2007, and 16 in 2009 at the dike in the inner lagoon. One of the 2004 rails was re-sighted near the railroad tracks in the central lagoon on December 13, 2004, six months following release, and one of the 2006 rails was observe repeatedly over six months off of the Rios Avenue trail. However, there have been no re-sightings since.

The cordgrass continues to expand and dominate a significant portion of the mouth of the San Diego River and an all-time high of eight pairs of breeding Light-footed Clapper Rails were there in 2004. However, this has not been sustained and only three pairs were detected in 2009. Based upon the extent and current condition of the habitat, it should abound with rails. However, regular high flows may limit the habitat suitability for the rails there. Additionally, during the installation of five nesting rafts in 2008, heavy trailing was noted into the marsh from the adjacent riprap. There appears to be an extremely large infestation of rats living in the riprap and venturing into the marsh to feed. Any eggs laid in the marsh would be extremely vulnerable to predation by rats prior to the initiation of incubation. For the fourth consecutive year there were reports of multiple detections of Clapper Rail 13 miles inland at Kumeyaay Lake. Again the freshwater marsh edging the lakes was checked to no avail. Based upon the reports received, these inland rails may have been conditioned by others over-using playback tapes.

Three of the breeding pairs of Clapper Rails reported for the Sweetwater Marsh NWR were actually inland along the Sweetwater River in fresh water marsh. The only detections in the salt marsh were a pair in the pond east of the volunteer parking lot and another on the southwest edge of the Vener Pond area between the main marsh and E Street Marsh. The pair in the pond bred successfully as evidenced by the observation of a chick swimming from the pond island. The Sweetwater Marsh Complex contains a thriving raptor population detected on every visit. The raptors have good hunting perches spaced regularly along the marsh edge. The marsh growth is low and the rails are quite vulnerable. Eleven captive-bred Clapper Rails were released into Sweetwater in 2005 and six more were released in 2008, but none have been re-sighted.

Los Penasquitos Marsh is dominated by vegetation indicative of prolonged closure to the ocean, particularly pickleweed. However, fresh water influence and freshwater marsh edge are increasing and the rails appear to be using the freshwater habitat increasingly. The detection of 12 pairs was a record high for this wetland in 2007. Unfortunately, this number plummeted to only two pairs in 2008, and back up to four pairs in 2009. There were also four advertising males mixed in with the breeders. Four captive-bred rails were released in 2004, four more in 2007, and nine in 2009. There was a re-sighting of a banded female hatched at the Wild Animal Park and released in 2007 at Los Penasquitos. She was photographed with her mate and three downy chicks on the edge of the pond below the San Diego Water Utilities Pump Station on

Sorrento Valley Road on July 10, 2009 by Eric Kallen.

The subpopulation in the University of California Reserve at Kendall-Frost rebounded significantly in 2004 and 2005, but was significantly reduced in 2006, 2007, and even further reduced in 2008. At seven pairs in 2009, it bounced back to half the size of its recent high count. This marsh is small, totally isolated, and surrounded by urban housing, but benefits from the University of California Reserve System management. The stewardship includes appropriate predator management, habitat restoration, and research management to assure minimal human disturbance to the rails and their habitat. Additionally, nesting rafts have been provided and are used heavily by the rails since 1987. There have also been translocations of eggs and adults. This resulted in the 2004 and 2005 breeding populations of 14 pairs, the highest total there since 1985, but it was not sustained. In spite of the appropriate management of the marsh, it may always be a struggle for the rails in such a tiny, isolated wetland.

One of the highlights of the 2006 survey of Light-footed Clapper Rails was the discovery of yet another breeding location in the Santa Ana River Marsh, also previously known as Newport Slough and listed in Table 1 under the Huntington Beach Wetlands. Four pairs were detected there in 2006 and 2007, only a single pair in 2008, and five pairs in 2009. The Santa Ana Marsh is at the southern terminus of the Huntington Beach Wetland Complex, several wetland patches strung along the coast totaling more than 200 acres. The 92-acre Santa Ana Marsh was restored as part of the Federal Flood Control Project on the Santa Ana River. Dampened tidal influence was re-established and cordgrass was planted primarily along a narrow eastern portion of the marsh that lies between an oil field and the south dike of the river. This cordgrass marsh is extremely well developed and patches have grown in the main marsh that are currently appear suitable for rails, but are unoccupied. Restoration of the Huntington Beach Wetlands is continuing and eventually we are hopeful that the Clapper Rails will occupy these restored wetlands up-coast as well.

The salt marsh at the mouth of the Santa Margarita River typically held a single pair of nesting rails for many years and occasionally there have been two. These pairs are invariably in the same spot(s) year to year. At the river mouth in freshwater marsh in the Sweetwater section of the estuary and/or between Stuart Mesa Road and the railroad tracks on the north side of the river in the freshwater marsh there, rimming a pond. However, in 2008 a single pair was located on the channel surrounding the least tern island at the junction of the inlet channel. Hopefully, Clapper Rails were still there and bred; we did not gain access in time to survey in 2009.

An adult Clapper Rail and a chick were observed in the South Bay Marine Reserve in 2005 after the survey report was compiled. In 2006, there was a strong clappering response to the tape by a single rail with no following advertising, indicating that for the second consecutive year there were breeding rails in the Reserve. In 2007, both a pair and a single responded to the tape; there was silence in 2008, and a single pair was detected in 2009. This small isolated marsh is expected to be regularly occupied once the habitat base in the south bay increases seven

years or more after the implementation of the proposed restoration of the new NWR; depending upon how much planting is accomplished.

The last known Clapper Rail call from Carpinteria Marsh was from an unmated female vocalizing constantly with no answering call in 2003. In 2004, there was total silence until April 13 when two males were released in the hope that the female was still alive. Unfortunately, in 2005 through 2008 the silence persists. This northern wetland is plagued with domestic cats in the marsh and other predators of concern. The Carpinteria subpopulation and wetland are in major need of intensive management but the wherewithal and interest appear to be lacking. A local resident recently reported red foxes actively denning on the edge of the marsh at the southern end of the dirt road extension of Esteros Way. Without dealing with the foxes in particular through consistent predator management, the chances for the rejuvenation of a viable subpopulation in Carpinteria Marsh are non-existent.

Clapper Rail vocalizations were reported for Bolsa Chica and the San Joaquin Reserve in 2008. However, breeding is not suspected to have occurred. Attempts to elicit responses to a tape-playback of a duet were unsuccessful at the Reserve in 2009, but were successful finally on October 2, 2009 at Bolsa where an upset bird clappered and kecked agitatedly as it traveled from the south to the vicinity of the walking bridge over the outer lagoon.

Nine of the 16 marshes with breeding Clapper Rails in 2009 had skewed sex ratios; all but one were male-skewed. A total of 66 advertising males and two females were heard during the call counts including: seven unmated males at Point Mugu; 13 single males on the Seal Beach NWR; one male in the Santa Ana Marsh; two males at Upper Newport Bay; three males in Buena Vista; one female in Batiquitos Lagoon; two males in San Elijo on Escondido Creek; 13 males in the San Dieguito River Valley; four males in Los Penasquitos Lagoon; and 23 males and one female in Tijuana Marsh. As in 2009, the usual condition has been a slight male bias during most years in most marshes. An extreme male skew like that in the Seal Beach NWR, San Dieguito River Valley, and Tijuana Marsh in 2009 indicates major issues, unfortunately of an unknown nature.

The continued annual release of additional captive-bred Clapper Rails is co-occurring with increased detections of rails in new locations, particularly inland sites. Highlights of Clapper Rail detections received in 2009 are as follows. Rachel Woodfield photographed a single Clapper Rail at the Ballona Wetlands in August 2008; a portion of the marsh was checked in 2009 with negative results. A Clapper Rail was heard and observed in Bolsa Chica at the foot bridge in October 2009. Sue Hoffman flushed a single Clapper Rail adjacent to the mouth of the Santa Ana River in the plover yard at the Huntington State Beach California Least Tern nesting colony in 2008; a dead rail was reported between PCH and the Tern Colony in July 2009. Clapper Rails are still reportedly vocalizing the reeds at Kumeyaay Lake on the San Diego River, but the calls are not well described and RZ could not get them to call back in response to tapes (this appears to be a case of heavy call-back tape playing there by un-permitted

enthusiasts). Jan Nordenberg is still reporting Clapper Rails in the San Dieguito River Watershed well inland of the Polo Club (see description above). Paul Lehman reported seeing a Clapper Rail at the northern end of Upper Otay Lake on April 20, 2009. One of two banded rails sighted on Seal Beach by John Fitch in December 2009 was from the release there; the other was banded in 2007 and either came down from Point Mugu or up from San Elijo. Two Clapper Rails were also sighted at Dog Beach at the Mouth of the San Diego River on September 26, 2009 by BJ Stacey. Lastly, Barry Nerhus reported hearing a Clapper Rail at the UCI Marsh in November 2009.

The Light-footed Clapper Rail population in California recovered with a 37% increase in 2009 from a crash in 2008. Unusual weather patterns appeared to have greatly disrupted the synchronicity of breeding activity in recent years making it difficult to get accurate estimates of rail numbers during call counts. For example, the subpopulation on the Seal Beach NWR is able to be monitored more intensively than any other because of the characteristics of that marsh. Most of the rails nest on rafts that are regularly monitored and high tide counts work there as well. The most successful of the call count efforts yielded an estimate of 12 breeding pairs, whereas a minimum of 19 pairs nested on the Seal Beach rafts. However, the nest search results at Upper Newport Bay have been very poor in recent years. The few egg nests found have been depredated at a rate of at least 50%, mostly by raccoons.

Management and Monitoring of Nesting Sites

Six egg nests were found in 2009 in Upper Newport Bay compared to two egg nests in 2008. Four observers working over seven field-days and 84 field-hours searched the same areas as former years. One of the two 2008 nests was depredated, the other was still active on July 17 which is later than the last re-nest date in usual years. In 2009, three of six egg nests were depredated and the eggs were not viable in a fourth. In 2007, intensive nest searches over 17 days, perhaps 100 acres, and 300 field-hours revealed only six incubation nests, four of which were depredated in the same areas that in 2006 held 24 nests, 12 of which were active egg nests when discovered. Nesting activity and hatching results have gravely deteriorated recently in Upper Newport Bay. There were signs of raccoon (*Procyon lotor)* well out into the marsh, spanning the Bay; as well as stirring of sediments, habitat disturbance, and noise associated with the ongoing dredging activity. How this subpopulation rebounded and is maintaining its numbers is not clear.

Fifteen of the 87 rafts available in 2009 on the Seal Beach NWR held Clapper Rail egg nests, and four of those also held second clutches for a total of 19 clutches of eggs. This compares to last year's 17 clutches and 23, 32, and 20 clutches found on rafts in 2005 – 2007, respectively. There were an additional two unused nests found on rafts and 28 brood nests built on 27 rafts in 2009. Overall nesting success was 92%. Eighteen of the estimated 19 pairs in the NWR nested on rafts and there was one additional active nesting territory near the Heron Tower. The large number of brood nests built on rafts makes us suspicious that there may have been undetected incubation nests in natural habitat.

Rafts were instrumental in the rebounding of the Seal Beach NWR subpopulation in the early 1990s. For example, in 1993 there were 79 nests, 73 clutches of eggs, nine additional brood nests, and 79% hatching success on the 100 rafts available in the NWR. However, since the mid-1990s the numbers have fallen off dramatically for unknown causes. We continue to modify the raft design for better durability and function and to provide up to five times the number of rafts as there are nesting pairs. The rafts are heavily monitored and there have been no indications of unusually severe problems or extremely high predation rates during the nesting season. Post-breeding season survival has been poor on the NWR, perhaps due in part to the huge wintering raptor population. Continued efforts to provide enhanced natural and artificial cover will perhaps make a positive difference over time. Cordgrass cover was greatly enhanced by the unusually high rainfall in the winter of 2004/2005. This may have added enough predator-protection to increase rail survival and productivity in 2006. Unfortunately, this was not sustained into 2007 - 2009. However, 2010 is looking to be another wet year that will perhaps be reflected in enhanced habitat quality in 2010 or 2011 from which the rails can benefit.

Eight of the 16 rafts available for nesting in the University of California's Kendall-Frost Reserve held nests in 2009. There was evidence of eight clutches of eggs on six rafts and an additional two clutches in a tumbleweed lodged in the marsh. Of the 10 clutches, six hatched, the outcomes of three are unknown, and one was depredated by a predator.

Kendall-Frost is small, extremely isolated, and therefore plagued by mesopredator release. Furthermore, irresponsible pet owners allow their cats and dogs to roam into the marsh and misguided animal control officers have apparently released stray animals into the marsh and/or adjacent campground in the past. It is imperative that predator management be continued annually and be started before nesting actually begins each year. Even with the program operational there were fresh cat (*Felis domesticus*) and opossum (*Didelphis* virginianus) tracks on the saltpan and raccoon (*Procyon lotor*) passage on the far outer bank of the marsh. This little wetland had 24 breeding pairs of rails in 1984, evidence of its high potential. This subpopulation has foundered since, but then it rebounded significantly in 2004 and 2005. This area should be a focus of management efforts for rail recovery.

Certain that predator issues that arise cause difficult management dilemmas; a Cooper's hawk (*Accipiter* cooperi) probably caused some of the problems for rails in Kendall-Frost beginning prior to the 2006 breeding season. A large raptor was observed launching from the condominiums perfectly positioned hunting perches, speeding low along the main channel, and crashing into the marsh after unseen quarry. One such regular hunter could take a heavy toll, but trapping and relocating raptors is very specialized work and extremely labor intensive. Also, the removed raptor would likely be quickly replaced by another individual. Other alternatives including removing the suitability of perches, increasing escape cover, or hazing the hunters would be very labor intensive, costly, and might not work. On October 27, a large female Northern harrier attacked a rail and was probably successful; the rails cries eventually ceased

and the raptor stayed down, presumably feeding.

None of the rafts at the Sweetwater Marsh NWR was used by Clapper Rails for nesting in 2009. The only nesting documented in the marsh was again on the little island in the pond located directly below the volunteer parking lot and rail aviary. This pair was one of two that vocalized in response to the tape on March 25 from the pond below the aviary and in Vener Pond.

Sweetwater Marsh is another high marsh that is not influenced significantly by high tides, except the extreme highs, particularly when they are storm-driven. Most of this marsh is high and dry enough to provide excellent foraging opportunities for predators and many species of raptors and terrestrial predators take full advantage, as evidenced by the high rate of depredation observed of released rails in 2005 (Zembal et al. 2005). The few rails documented in the marsh in recent years were in those parts of the wetland most regularly influenced by tidal inundation or ponded water.

During the first spring call counts in 2009, nine breeding territories were in evidence at Point Mugu along with seven unmated males. By the end of the breeding season further evidence of breeding activity had been discovered in seven of those territories. Seven nests were found at Point Mugu in 2009: four were egg nests, each with at least a partial hatch; new nests were found in three territories; and active chick feeding was in evidence in five territories associated with brooding spots and at least one brood nest.

Although natural nesting cover was thought to be a limiting factor for the rails at Point Mugu, artificial nesting rafts placed there in 1988 were not used over the several years they were maintained and monitored. Even if rails discovered such structures during high tides, they would not be drawn to them for nesting at Point Mugu because of the significant acreage of natural cover that is not inundated by high tides. However, artificial rafts were tried again in 2008 and one was used successfully by a nesting pair with some evidence of partial use of two others. Given the years of experience at Point Mugu with the rails, the new rafts were placed more strategically. Because of the use observed in 2008, five additional rafts were placed on June 27 bringing the total available at Point Mugu to 10 rafts. The raft that was used by a nesting pair in 2008 was used again in 2009. An 8-egg clutch hatched but four of the chicks were discovered dead in or near the nest. They were collected and delivered to the Contaminants Division of the US Fish and Wildlife Service, Carlsbad Field Office to check for contaminants issues. That analysis is pending.

Captive Breeding

The captive Clapper Rails at the CVNC bred successfully for the first time in 2001, after we brought in a second pair of rails and switched their mates. Each pair laid a single clutch, one of eight and the other of seven eggs. The eight-egg clutch was taken to Sea World to be hatched and reared, hoping that the pair would lay another clutch. They did not. Seven captive-reared rails were released into Mugu Marsh that first year. Additional rails have been added to the

captive breeders and their progeny have been released to the wild annually since then.

Six incubation nests were found in Upper Newport Bay in 2009, three were depredated probably by raccoons, and the eggs in a fourth were infertile. Two eggs were taken from the two active nests to Sea World on June 8 where they were artificially incubated, hatched, and the youngsters were reared to adulthood. All four rails turned out to be males. One of these # 362 was used to replace male #206 at the Wild Animal Park after the 2009 breeding season. The pair 206/209 has not been very productive. Since females are harder to obtain than males #209 was retained and mated with one of the newly hatched males from Newport.

SWC Breeding Pair I – Polar Aviary (LFCR359/366) LFCR091 (paired with LFCR359) produced two offspring in 2008 (from clutch of six eggs). She (366) exhibited gait abnormalities and mild abdominal distention in January and was found dead 3/26/09. She did not produce eggs in 2009. Female LFCR366 was collected from Tijuana Estuary on 10/5/09 and transferred to SeaWorld for 30 day quarantine. LFCR366 was paired with LFCR359 in the "Polar Aviary" at SeaWorld for breeding. No chicks were produced from Breeding Pair I in 2009. LFCR155 was transferred to CVNC on 8/5/09 for retirement per recovery plan.

SWC Breeding Pair II (LFCR089/LFCR218) All chicks were hatched under parents. The pair laid four clutches of eggs: Clutch I found 2/15/09 – seven eggs, six hatched 3/11/09; Clutch II found 4/2/09 of 12 eggs, zero were viable; Clutch III found 5/28 of eight eggs, zero were viable; Clutch IV found 7/20 of seven eggs, one chick found dead at hatch, two hatched 8/3 (LFCR363) and 8/5 (LFCR364); LFCR363 and LFCR 364 transported to CVNC on 9/17/09. Non viable eggs had no development, and were examined by candling only. Eggs from Clutch II and III were transferred to USFWS for research.

Egg Transfers: Eggs N2E1, N2E2, N3E3, N3E2 were collected Upper Newport from wild nests and transferred to SeaWorld 6/7/2009. Eggs were incubated in a Humidaire incubator at 99° F with a wet bulb of 82-84° F, transferred to a Grumbach hatcher at 98° F with a wet bulb of 88° F on 6/15 and hatched unassisted on 6/19. The birds were hand-raised using modified puppet rearing techniques. LFCR359 remained at SeaWorld and LFCR362 was transferred to the Wild Animal Park on 9/3/09. The remaining two birds (LFCR360 and 361) were transferred to the CVNC on 9/17/09. All four birds were gender sexed males.

LFCR315 was received as an egg from CVNC on 3/13/09 and artificially hatched and hand reared using modified puppet rearing as a single bird (no clutch mates). LFCR315 was transferred back to the CVNC on 4/23/09.

Four of six captive pairs produced young in 2009, both pairs at the Chula Vista Nature Center and one each at Sea World and the Wild Animal Park resulting in the release of 42 additional Clapper Rails into five marshes (Table 4). This brings the total number of captive-reared Light-footed Clapper Rails released into the wild since 2001 to 252. Point Mugu has been

the priority for releases up until 2009 with 107 rails released. However, 2009 may have been the final release date there since the Biological Opinion from the Fish and Wildlife Service mandating US Navy participation in the captive breeding program only required their participation through 2008.

Going into the breeding season in 2010, the three propagation facilities will continue to house two breeding pairs each. Sea World will house pairs LFCR 359/366 and LFCR 089/218; Chula Vista Nature Center has pairs LFCR 219/217 and LFCR 208/052; and the Wild Animal Park has pairs LFCR 362/209 and LFCR 207/246.

Table 3. Clapper Rail Breeding Activity at Sea World, 2009.

Parent IDs	LFCR218/089	LFCR218/089	LFCR218/089	LFCR218/089
Clutch # (1st, 2nd…)	1st	2nd	3rd	4th
Date Clutch Initiation	UNK	UNK	UNK	UNK
Date Clutch Completion	2/18/09	~4/13	5/28/09	7/20/09
# Eggs	7	12	8	7
Incubation Initiation	2/18/09	4/10/09	5/28/09	7/20/09
Hatch Dates (# eggs)	3/11/09 (6)	N/A	N/A	8/3 AND 8/5 (2)
# Eggs Hatched	6	0	0	0
#Chicks 1 Wk. Old	6	N/A	N/A	2
#Chicks 2 Wks. Old	6	N/A	N/A	2
#Chicks 3 Wks. Old	6	N/A	N/A	2
# Moved to Conditioning	6	N/A	N/A	2
Age When Moved	65 days	N/A	N/A	45 days

Table 4. Number of Captive-reared Light-footed Clapper Rails Released into Target Marshes, 2001 – 2009.

Marsh	01	02	03	04	05	06	07	08	09	Total
Point Mugu	7	11	20	12	17	3	5	27	5	107
Seal Beach NWR	-	6	-	5	-	-	-	13	5	29
Sweetwater MNWR	-	4	-	-	11	-	-	6	-	21
Kendall-Frost	-	-	5	-	-	-	-	-	7	12
Batiquitos Lagoon	-	-	-	8	8	-	-	-	-	16
San Elijo Lagoon	-	-	-	8	-	5	4	-	16	33
Agua Hedionda	-	-	-	5	-	-	-	-	-	5
Los Penasquitos	-	-	-	4	-	-	4	-	9	17
Carpinteria Marsh	-	-	-	2	-	-	-	-	-	2
San Diego River	-	-	-	-	5	-	5	-	-	10
Total	7	21	25	44	41	8	18	46	42	252

Table 5. Clapper Rail Breeding Activity at the Chula Vista Nature Center, 2009.

Parent Ids LFCR	208/052	208/052	208/052	219/217	219/217
Clutch# (1st, 2nd…)	1st	2nd	3rd	1st	2nd
Date Clutch Initiation	2/10/09	3/21/09	6/21/09	3/09/09	
Date Clutch Completion	2/20/09 7 eggs	~4/05/09 8 eggs	6/24/09 3 eggs only	3/16/09 7 eggs	Unknown 4 eggs found 4/28/09
Incubation Initiation	?	?	?	?	?
Hatch Dates	3/10/09- 3/13/09*	4/24/09 & 4/25/09	7/16/09	4/09/09	5/23/09
# Eggs Hatched	6 of 7	8 of 8	2 of 3	4 of 7	7 of 8
# Chicks 1 Wks. Old	6	7	2	4	7
Parent Ids LFCR	208/052	208/052	208/052	219/217	219/217
# Chicks 3 Wks. Old	6	7	2	4	7
# Moved to Conditioning	5	7	2	4	7
Age When Moved	64 days	~52 days	69 days	67 days	~61 days

*One egg was late to hatch. That egg was transferred to SeaWorld where it hatched in the incubator. The chick was hand reared (LFCR315).
A single egg was found on the nest of LFCR 208/062 6/01/09 but was missing the next day.
This was not considered part of clutch 3.

Banding and Telemetry

The banding session at Upper Newport Bay yielded two males. Both were banded and released at their points of capture. We were unsuccessfully trapping for a female to replace the female that died at Sea World, LFCR 091. This was accomplished at Tijuana Slough NWR, where the only capture was a female LFCR 366 who was immediately banded and moved to quarantine at Sea World. All of the 42 rails released to the wild in 2009 were banded; band numbers are noted in the Methods section herein. Trapping efforts at the Seal Beach NWR were fruitless and there were no telemetry efforts in 2009.

Re-sightings of banded rails were numerous in 2009 as noted under survey results above and summarized as follows. Perhaps the most significant sighting in 2009 was of at least one banded rail among three sighted by Rebecca Kelley at the Vern Freeman Diversion on the Santa Clara River. The river is about 12 miles up the coast from Point Mugu and about 12 miles inland. The sighting constitutes additional corroboration of our suspicion that some of the rails relocated to Point Mugu are traveling elsewhere. In addition, John Fitch photographed two banded rails in the Seal Beach NWR on a raft during high tide. One had the 2009 gold band and was undoubtedly released there; the other carried an anodized blue band on the left leg and so was banded in 2007. Since there were no releases in Seal Beach in 2007, the rail either came south from Point Mugu or north from San Elijo Lagoon. Also of significance was a re-sighting of a female hatched at the Wild Animal Park and released (presumably) in Los Penasquitos in 2007. She was sighted with a male and three chicks that were obviously hers; at least one captive reared rail is contributing to local reproduction. Jim Roberts reported seeing one of our 2009-released and banded rails in the Kendall-Frost Reserve seven days after the release date. The rail was accompanied by another whose legs were unseen and unfortunately both were up against the chain link fence between marsh and uplands below the observation deck. One last unique sighting was of Clapper Rails at Dog Beach near Robb Field at the mouth of the San Diego River. This area will be surveyed in 2010 for potential additional habitat and breeding activity by Light-footed Clapper Rails. Barry Nerhus heard a Clapper Rail calling from the fresh water marsh at the San Joaquin Reserve just upstream of Upper Newport Bay and also reports a Clapper Rail from the footbridge area of the Bolsa Chica Reserve. Lastly, Martin Ruane has noted Clapper Rails on numerous occasions near the up coast boundary of Point Mugu at Ormond Beach along a ditch there with clumps of fresh water reeds. This is well north of any known nesting location in Point Mugu and will be checked in 2010.

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LITERATURE CITED

Massey, B.W., and R. Zembal. 1980. A comparative study of the Light-footed Clapper Rail in Anaheim Bay and Upper Newport Bay, Orange County, CA. Contract Rep., End. Spp. Office, U. S. Fish and Wildl. Serv., Sacramento, CA. 69pp.

Massey, B.W., R. Zembal, and P.D. Jorgensen. 1984. Nesting habitat of the Light-footed Clapper Rail in southern California. J. Field Ornithol. 55: 67-80.

Soule, M.E., D.T. Bolger, A.C. Alberts, J. Wright, M. Sorice, and S. Hill. 1988 Reconstructed dynamics of rapid extinctions of chaparral-requiring birds in urban habitat islands. Conservation Biology 2(1): 75 - 92.

U. S. Fish and Wildlife Service. 1985. Recovery Plan for the Light-footed Clapper Rail. Portland, OR. 121 pp.

Zembal, R., and B. W. Massey. 1981. A census of the Light-footed Clapper Rail in California. West. Birds 12: 87-99.

Zembal, R., J.M. Fancher, C.S. Nordby, and R.J. Bransfield. 1983. Intermarsh movements of Light-footed Clapper Rails indicated in part through regular censusing. California Fish and Game 71: 164 - 171.

Zembal, R., and B.W. Massey. 1985. Distribution of the Light-footed Clapper Rail in California, 1980 - 1984. Amer. Birds 39: 135-137.

_____. 1987. Seasonality of vocalizations by Light-footed Clapper Rails. J. Field Ornith. 58: 41 – 48.

Zembal, R., B.W. Massey, and J.M. Fancher. 1989. Movements and activity Patterns of the Light-footed Clapper Rail. J. Wildl. Manage. 53: 39 – 42.

Zembal, R. 1992. Light-footed Clapper Rail census and study, 1992. Contract Report to Calif. Dep. Fish and Game, Wildl. Manage. Div., Nongame Bird and Mammal Section Rep. 91-3. 32pp.

_____. 1993. The need for corridors between southern California's coastal wetlands and uplands, in J. E. Keeley, ed., Interface between Ecology and Land Development in California, Symposium proceedings, Southern California Academy of Sciences meetings at Occidental College, 1992.