

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

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

2008 Season

By

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

Nongame Wildlife Program, 2009-05

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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Huntington Beach Wetlands Conservancy
24821 Buckboard Lane
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ABSTRACT

The twenty-ninth annual census of the Light-footed Clapper Rail (*Rallus longirostris levipes*) in California was conducted from 29 February to 8 June 2008. 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 234 pairs of Light-footed Clapper Rails exhibited breeding behavior in 15 marshes in 2008. This is the smallest statewide breeding population detected since 2001, representing a 47.2% decrease from the count in 2007 following four years of successive record-breaking high counts. Upper Newport Bay was once again the largest subpopulation in California but had decreased by 46.7% from its second highest total in 2007. Tijuana Marsh NWR also plummeted from an all-time high level of 142 pairs in 2007 by 67% in 2008 to just 47 breeding pairs. The Newport subpopulation comprised 37.6% of the state population in 2008 and the subpopulation in the Tijuana Marsh NWR comprised 20.1%, together accounting for 57.7% of the breeding population of this rail in California.

Three of the small subpopulations increased in size from the 2007 totals. Those on the San Dieguito River, Agua Hedionda Lagoon and Buena Vista Lagoon totaled 37 breeding pairs compared to 27 pairs in 2007. The subpopulation in Batiquitos Lagoon maintained its size at 22

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breeding pairs. Eight of the smaller subpopulations were reduced by 29% - 83%. Point Mugu was reduced to five breeding pairs and the Seal Beach tally was reduced to 17 pairs. Batiquitos Lagoon held a record high of 22 pairs in 2007 and 2008. Buena Vista Lagoon had an all-time high count of nine breeding pairs.

Excluding the two largest subpopulations, there were three subpopulations in double figures, ranging from 17 to 22 pairs and totaling 60 breeding pairs or 25.6% of the state total. The remaining 10 subpopulations ranged from one to nine pairs and totaled 39 breeding pairs of clapper rails, or 16.7% of the total. The annual increases in the population total of the Light-footed Clapper Rail 2002 – 2007 gave encouragement that restoration and management were contributing to the recovery of this endangered bird. The 2008 survey results illustrate how vulnerable these birds are.

Additional nesting activity was observed in four of five breeding territories at Point Mugu. Incubation nests were found in two territories, brood nests in one territory and there was evidence of chick feeding in three territories. No egg translocations were accomplished because of the asynchrony in incubation timing between Newport and the target marshes. No eggs were taken from Newport to augment the captive flock because of limited Newport nesting and heavy egg losses to raccoons (*Procyon lotor*). On the Seal Beach NWR there were 20 nests built on 19 rafts and 18 brood nests on 18 rafts and 17 clutches of eggs, five of which were second clutches. Hatching success was 97%. Nest searches at Upper Newport Bay revealed only seven nests, two were active incubation nests, one was depredated by raccoons and the fate of the second is unknown. At the Kendall-Frost Reserve 15 of 18 rafts held nests with five clutches of eggs, only one of which 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 pairs nested successfully with the sighting of chicks with their parents.

All six captive pairs laid eggs in 2008. As a result, 46 Clapper Rails were released to the wild: 27 at Point Mugu, 13 in the Seal Beach NWR, and six in the Sweetwater Marsh NWR. This brings the total number of rails released to the wild since 2001 to 210.

INTRODUCTION

The Light-footed Clapper Rail 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 begun in 1980 until 2004 when 350 pairs were detected in 15 marshes. Since then there were annual increases until 2007 when 443 breeding pairs were detected in 19 marshes.

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 the wildlife that inhabits them 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 a coastal wetland 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 is essential in understanding the effects of other management efforts and in

stewardship of this critically endangered bird toward recovery. The genetic and demographic augmentation of the smaller subpopulations may be critical to overall population viability in the long term. To this end important partnerships have been developed beginning in 1998 with staffs of the Chula Vista Nature Center and Sea World, San Diego. Beginning in 2005 the Wild Animal Park will join them in the development of a protocol for captive propagation.

Reported herein are the results of the 2008 statewide survey, management, other study efforts, and releases to the wild of Light-footed Clapper Rails resulting from the development of a protocol for captive breeding.

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 ft. 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 are 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, 9 - 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 29 through June 8, 2008. 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 five wetlands wherein such data were gathered in 2008 and high tide counts were accomplished on October 26, 2007 and November 12, 2008 on the Seal Beach NWR. 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 four marshes with abundant clapper rails, mapping spontaneous calls was the prevalent technique. In marshes with few 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 performed by three observers, but primarily the principal investigator. Additional observers participated in the 2008 counts primarily in three of the locations, 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 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 "clapping" call appears to be responded to by 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. If played at a time of day when the rails are not particularly prone to call, the only response likely to be elicited is that of the territorial pair intruded upon. 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 considerable 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 "clappings" 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 "clapping" is as good an indicator of a territory as a duet, when advertising is not heard later from the same territory. 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 2008 call counts were conducted on 35 dates and totaled approximately 362 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 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 the 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 1 - 4 birds and resulted in successful breeding and recruitment (Allen et al. 1993).

Site fidelity is also a factor that could jeopardize the success of translocation efforts. The Light-footed Clapper Rail is viewed as a highly sedentary species (Zembal et al. 1983) but the reaction of an adult to being moved is unknown. Which site, old or new would be shown fidelity?

In recognition of the many potential issues associated with the extreme rarity of this rail, we used the least intrusive method of genetic and demographic augmentation, egg translocation. Initially, eggs were moved from Upper Newport Bay, the subpopulation exhibiting the highest genetic variability, into the smaller wetlands. Using eggs, rather than adults greatly reduced effects on the donor subpopulation and gave maximum assurance of post-translocation site fidelity. One or two eggs were taken from a Newport nest and transported immediately in a portable incubator into a nest at the same stage of incubation in Mugu Lagoon, Seal Beach NWR, or the Kendall-Frost Reserve. The eggs for translocation were candled and floated to determine viability and stage of development. A maximum of 10 eggs could be moved into each of the five potential recipient marshes per year. Eggs were marked with indelible ink and followed to hatching. The ultimate success of translocation will be determined by comparing subpopulation size trends, before and after, aided by 20 years of annual population surveys.

Nests that received Newport eggs were augmented to a maximum clutch size of 10. When adding one or two eggs would bring the total clutch to 10 eggs or more, one or two eggs would be removed in exchange for the Newport eggs that were deposited. Undeveloped eggs, if present, would be removed first. Viable eggs removed from receiver marshes would be used to augment other clutches or hatched and raised in captivity and returned to the marsh as fledglings.

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 2008. 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 regularly used in only three of seven marshes where they have been tried. Those three and the number of rafts in each during the 2008 season were the Seal Beach NWR with 82 rafts, Kendall-Frost Reserve with 18 rafts, and Sweetwater Marsh NWR with five rafts (that were just placed in 2008). 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. Raft maintenance and monitoring involved a minimum of 311 field-hours.

A new nest raft design and cover were deployed in 2008. The raft looks like a small palette measuring 33 in X 24 in. The top is made of four 1 in 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, and Kendall-Frost Reserve in 2008. At Upper Newport Bay 22 field-days, 29 February – 24 July by up to 10 observers resulted in 256 field-hours of nest searching and observation. There were 15 dates at Point Mugu by 1 – 8 participants and 357 field-hours. On the Seal Beach NWR 2 - 5 observers accumulated 185 field-hours over 15 dates. There were 66 field-hours spent at the Kendall-Frost Reserve by 2 – 17 observers over 7 dates. The nesting and other activities at Sweetwater Marsh and of the captive rails at the Chula Vista Nature Center, Sea World, and the Wild Animal Park were monitored daily by one to seven observers for a total of many 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 (Zemba et al. 2005).

There were six potential breeding pairs in captivity in 2008, two pairs at each of the three facilities. The CVNC housed rails #208/052 and 219/217; Sea World held #089/218 and 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. 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.

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 small cut up pieces of lettuce, cricket abdomens, graduating to whole live crickets as the chicks grow, guppies, herring filets, pieces of capelin without bones or scales, krill with tails and heads removed, live meal worms with heads removed, live wax worms with heads removed, live black worms, pinkies, live red worms, 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 8 – 10 days 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 2008.

In 2008, 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.

Banding and Telemetry

There were no banding sessions conducted at Upper Newport Bay in 2008. 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 as in 2006. However, in 2008 reproduction was poor in Newport and depredation by raccoons was a major issue. Consequently, no eggs were taken.

There were 46 rails released to the wild in 2008: five into Point Mugu on June 24; 22 into Point Mugu on July 10; seven into the Seal Beach NWR on October 16; six more into Seal Beach NWR on November 2; and six into the Sweetwater Marsh NWR on November 4 and 9.

All of the Clapper Rails raised in captivity and released to the wild were banded (see Zembal and Massey 1983 for a full discussion of trapping and banding techniques). The annual code for 2008 was an anodized blue metal band on the right leg; the Service band was placed on the left leg. USFWS band numbers on the rails released to Point Mugu were #103544926 – 103544930 on June 24; and #104521702 – 104521707 and #106539801 – 106539816 on August 22, 2008. Those released in Seal Beach were banded 106539817 – 106539823 on October 16 and 106539824 – 106539829 on November 2. Four of the rails released into the Sweetwater Marsh were banded, two escaped handlers before being banded. The rails released into Sweetwater intentionally wore bands #1065-39830 – 106539833.

RESULTS and DISCUSSION

Population Assessment

A total of 234 pairs of Light-footed Clapper Rails exhibited breeding behavior in 15 marshes in 2008 (Table 1). This is a 47.2% decrease from 2007 and represents the lowest reproductive potential observed since 2001. This crash follows four years in succession of record-breaking high counts. The state total has been larger than in 2008 in 16 of the 29 years of record. The subpopulation in Upper Newport Bay was once again the largest in California but was down 47%. The Tijuana Marsh NWR subpopulation reached a record level of 142 pairs in 2007 but by 2008 only 33% of that total remained. The Newport subpopulation comprised 37.6% of the state total in 2008 and the Tijuana Marsh NWR subpopulation comprised 20.1%, together accounting for 57.7% of the breeding population of the Light-footed Clapper Rail in California. In addition, four marshes held 9 – 22 pairs each for a combined total of 69 pairs or 29.5% of the state total.

The spring of 2008 was not very conducive climatologically to consistent clapper rail breeding activity, or therefore successful call counts. The late winter and spring were the driest on record and the spring was severely cold into May. There was one un-seasonal hot spell in winter during which the Newport rails were exceedingly more vocal than at any one time all spring and early summer. Many surveys were re-scheduled due to poor calling activity. The rails were vocal on very few days; during most of the surveys there was little or no activity. Sites that would normally be completed in a single visit were re-visited twice or three times before vocalizing was heard. At Upper Newport Bay, for example the counts normally require eight early mornings or late evenings to complete.

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2008.**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
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#

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2008.
(continued) **Part I: 1980 – 1989**

	Number of Pairs Detected In:									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
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, 1980-2008.
(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

Table 1. Census of the Light-footed Clapper Rail in California, 1980-2008.
 (continued) **Part II: 1990 – 1999**

Location	Number of Pairs Detected In:									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
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#
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).

Paul Jorgensen Unpublished data; b 2 pairs are in Famosa Slough.

Table 1. Census of the Light-footed Clapper Rail in California, 1980 – 2008.
 (continued) **Part III: 2000 – 2008.**

Location	Number of Pairs Detected In:									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Santa Barbara County										
Goleta Slough	-	0	0	0	-	-	-	-	0	
Carpinteria Marsh	1#	1#	2	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#	
Los Angeles County										
Whittier Narrows Marsh	-	-	0	-	-	-	-	0	-	
Orange County										
Seal Beach NWR	10#	11#	24#	23#	16#	15#	21#	24#	17#	
Bolsa Chica	0	0	0*	0	0	0	*	*	*	
Huntington Beach Wetlands	-	0	0	0	0	0	4#	4	1#	
Upper Newport Bay	150#	124#	129#	144#	165#	174#	158#	165#	88#	
San Joaquin Reserve	0	0	0	0	-	0	0	0	*	
Carlson Rd Marsh	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	
Guajome Lake Marsh	0	-	-	0	-	-	0	0	0	

Table 1. Census of the Light-footed Clapper Rail in California, 1980 – 2008.
(continued) **Part III: 2000 – 2008.**

Location	Number of Pairs Detected In:								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Buena Vista Lagoon	5#	3#	6#	5#	5#	6#	8#	8#	9#
Agua Hedionda Lagoon	2	2	1	4	5	4#	7#	4	7
Batiquitos Lagoon	2#	3#	3#	5	11	16#	19#	22	22
San Elijo Lagoon	1#	1#	2	7#	7#	6#	15#	12#	5#
San Dieguito Lagoon	0#	0#	0	0#	6	12#	31#	15#	21#
Los Penasquitos Lagoon	1	1	2	1#	2#	2	7#	12#	2#
Kendall-Frost Reserve	4	4	5#	6#	14	14	5#	4#	2#
San Diego River	3#	4	6	6#	8#	5	4	6	4#
Paradise Creek Marsh	0	0	0	0	0	0	0	0	0
Sweetwater Marsh	2	3#	3#	1#	3#	1	4#	4#	3
E Street Marsh	2	0	1	1	0	0	2	1	0
F Street Marsh	0	0	0	0	0	0	0	0	0
J Street Marsh	1	0	0	1	0	0	0	0	0
Otay River Mouth	1	1	1	0	0	1	2	1	0
South Bay Marine Reserve	0	0	0	0	0	0	1	2	0
Dairymart Ponds	-	-	-	2	1	1	0	1	-
Tijuana Marsh NWR	61#	52#	78#	64#	87	87#	102#	142#	47#
Total: pairs	253	217	274	286	350	360	408	443	234
marshes	16	14	16	16	15	16	18	19	15

- indicates that no census was taken.

* indicates a fall or winter occurrence.

indicates the detection of unpaired rails (used beginning in 1987).

In 2008, the Newport counts were started in February and not completed until late April because of the extreme variability in vocalizing. In addition to the unusual cold, windy conditions, Newport was being dredged to save it from filling in with sediment. No direct impact of the dredging operation was detected but the monitoring for impacts relied mostly on finding and watching active nests. Only two egg nests were found in 2008 using the same level of nest searching effort as in former years, one was predated and the other nest was being incubated on July 17, which is later than the last re-nest date in years where dredging hadn't occurred. In 2007, intensive nest searches that took place in over 17 days, covering approximately 100 acres, and requiring 300 field-hours revealed only six incubation nests (four of which were predated) in the same areas that in 2006 held 24 nests, 12 of which were active egg nests when discovered. Nesting activity and results have degraded significantly over the last two years.

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 unprecedented at any marsh except Upper Newport Bay; the 95 pair decrease in 2008 is simply unprecedented. This subpopulation has not been this small since 1991. All but one of the 47 pairs detected were in the northern third of the Oneonta Lagoon portion of the marsh. The calling frequency at Tijuana Marsh that evening was so poor that several of the observers heard nothing. It is also of interest that this crash comes at a time when the Mexican marshes occupied by Light-footed Clapper Rails are apparently under heavy siege by domestic animals being grazed directly in the salt marshes.

The subpopulation in Batiquitos Lagoon maintained its 2007 level at 22 pairs and was the third largest in the state in 2008. The rails increased gradually in Batiquitos as the ecological functionality of the wetland continued to improve over time following the major restoration project implemented there. In December 1996, the mouth of the lagoon was opened to the ocean, the final step in a \$57 million restoration project and since then the carrying capacity for Clapper Rails has been on the rise. 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. In 2008 there were at least four breeding pairs vocalizing from the edge of the western tern island; nine pairs along the north edge of the inner lagoon; eight pairs along the southern edge; and a 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. There was one pair there in 2008 in the northeast corner in a reed bed bordered by the tallest cordgrass in the west basin. Marsh restoration appears to be working for this endangered bird in Batiquitos Lagoon, increasing expectations for a large, thriving population there within a decade or so.

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.

Additional Clapper Rail detections were reported in 2008 inland of the known subpopulation in the San Dieguito Creek Watershed. One report was accompanied by a photo of a Clapper Rail taken at a pond at the 4S Ranch Community Park on Dove Creek Road just west of 4S Ranch Parkway. Clapper Rails were also reported from marshes along the west and east sides of 4 Gee Road, just north of Camino Del Sur. This area will be added to the survey in 2009.

The Seal Beach NWR subpopulation had been 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 a few pairs; calling during the evening of the census was minimal; and the population estimate is based upon the nesting activity on the rafts. With so much marsh available to the rails, there ought to be a much larger breeding population there. 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 where there is little cover and busy roads just beyond. This greatly exposes the rails to potential predation and vehicle collision. However, the completeness of inundation also allows for fairly dependable surveying of the subpopulation outside of the breeding season. Accordingly, the rails were counted again from canoes before and after the 2008 breeding season. The counts were on 26 October 2007 and 12 November 2008 and a total of 48 and 20 individuals were sighted, respectively (Table 2). The pre-nesting season count tied for the most elevated high tide count this decade, so far. The post-season count is the lowest total since 1999 and does not bode well for the 2009 breeding season. Either some of the rails had already moved undetected onto the edges and were not counted, or there were heavy losses at the end of the breeding 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 sequestered on rafts and thereby afforded much better protective cover.

The 2008 count in Buena Vista Lagoon indicated that this wetland's former high count of eight pairs had been exceeded by one. Totals of six pairs, seven singles, and two males were detected. Of these, two pairs were in the central lagoon; five were in the inner lagoon; and there were two pairs detected in the little outer lagoon. A singing male Belding's Savannah Sparrow (*Passerculus Sandwichensis beldingi*) was heard on the north side of the inner Lagoon on March 21. There are many management issues at this little freshwater marsh and they are shared with most of the other coastal wetlands, including abundant non-native trees 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 elevated.

Table 2. High Tide and Call Counts of Clapper Rails on the Seal Beach National Wildlife Refuge, 1975 - 2008.

Date	Tidal Height	Clapper Rails Counted	Breeding Pair Members		Notes
			Before	After	
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
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
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	
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	

Table 2. High Tide and Call Counts of Clapper Rails on the Seal Beach National Wildlife Refuge, 1975 - 2008. Continued

Date	Tidal Height	Clapper Rails Counted	Breeding Pair Members		Notes
			Before	After	
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	
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	-	

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, was down to four pairs in 2007 and back up to seven pairs in 2008. 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.

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. Unfortunately, there was a crash in 2008 back to five pairs. There is an efficient predator management program in place, consistent rail and marsh management, and the Clapper Rails are still breeding, although this subpopulation is not as large as would be hoped for in this, the biggest contiguous patch of potential habitat in the state. Again in 2008, at least one rail attempted to breed in the eastern arm of the lagoon. Unfortunately, it was an advertising female.

The 2008 census was the second successive year of unusually intermittent vocalizing and late or reduced breeding activity at Point Mugu. Between May 14, and June 19 over 200 hours of systematic field observations were accrued, mostly by the same observer, both in the early morning and late afternoon. During these observations “kecking” was the most common rail

vocalization heard. There were only six duets recorded from three locations; four single “clapperings“ from two locations; 15 incidents of “kecking” from several locations but mostly from two; and keck-burring from a single location in the Central Arm. Only two egg nests were found in 2008 and one was still being incubated on July 16, 2008. Again, this is very late nesting.

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 resighted 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; others may have behaved similarly.

The San Elijo Lagoon subpopulation was at its second highest level in 2007 with 12 pairs of breeding Clapper Rails. Unfortunately in 2008 there were only five pairs in evidence, the lowest detected reproductive potential in six years. 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 edge fresh water marsh growth along the lagoon edges, two pairs in the east basin and three 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 and five in 2006 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 four pairs were detected in 2008. 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 a very 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. For the third 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.

Two 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 detection in the salt marsh was a pair in the pond east of the volunteer parking lot. The pair in the pond bred successfully as evidenced by the observation of a chick swimming from the pond island on the 11th of June. The Sweetwater Marsh Complex sustains a thriving raptor population, fully in evidence on every visit. The habitat has ample good hunting perches spaced regularly along the marsh edge and the marsh growth is low which makes the rails vulnerable to predation. Eleven Clapper Rails were released to Sweetwater in 2005 but none has 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. There were also three advertising males along Sorrento Valley Creek, inland of the 805 freeway where the fresh water marsh is gradually being overtaken by willows. Five captive-bred rails were released in 2004, but there have been no re-sightings.

The subpopulation in the University of California Reserve at Kendall-Frost rebounded significantly in 2004 and 2005, but was significantly reduced in 2006 and 2007. The population was further reduced in 2008. Although this marsh is small, totally isolated, and surrounded by urban housing, it is managed under the University of California Reserve System. The stewardship includes appropriate predator management, habitat restoration, and researcher management to assure minimal disturbance to the rails and their habitat. Additionally, nesting rafts have been provided and used heavily by the rails since 1987. There have also been translocations of eggs and adults. This effort resulted in 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. For example, a Cooper's hawk was observed powering through the main tidal channel again in 2008; just one such animal remaining local and hunting from the adjacent high-rise condominiums would have excellent visual access to the entire wetland and take a major toll on the rails. A Cooper's hawk was video-taped in 2006 tenaciously crashing into pickleweed after a Clapper Rail at Bolsa Chica.

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 again in 2007 but only a single pair was detected in 2008. 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. To date, the rails inexplicably occupy only the western half of this cordgrass marsh.

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 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.

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 clapping 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 but there was silence in 2008. This small isolated marsh has the potential of being regularly occupied once the habitat base in the south bay is greatly increased many years after the implementation of the proposed restoration of the new NWR.

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 at the southern end of the dirt road extension of Esteros Way, on the very edge of the marsh. Without addressing the fox population 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. Several attempts to elicit responses to a tape-playback of a duet were unsuccessful.

Twelve of the 15 marshes with breeding Clapper Rails in 2008 had skewed male sex ratios. A total of 72 advertising males and four females were heard during the call counts including: two unmated males and a female at Point Mugu; five single males and a female on the Seal Beach NWR; one male in the Santa Ana Marsh; 19 males at Upper Newport Bay; one male on the Santa Margarita River; two males in Buena Vista; two males in San Elijo; three males in the San Dieguito River Valley; three males in Los Penasquitos Lagoon; two males in the Kendall-Frost Reserve; a single male on the San Diego River; and 31 males and two females in

Tijuana Marsh. As in 2008, the usual condition has been a slight male bias during most years in most marshes. An extreme male skew like that on the Seal Beach NWR in former years, Upper Newport Bay and Tijuana Marsh in 2008 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. Many reports of Clapper Rail detections were received in 2008 as follows. Rachel Woodfield photographed a single Clapper Rail at the Ballona Wetlands in August; this is very significant since there have been only two other records there since 1950 but nothing recent until now. Dick Newell photographed a Clapper Rail in Bolsa Chica at the foot bridge in late December 2007. 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 (*Sternula antillarum browni*) nesting colony on August 1. Christine Harvey reported Clapper Rails vocalizing twice at Kumeyaay Lake on the San Diego River, northwest corner of the first lake on February 27. Jan Nordenberg reports Clapper Rails from multiple sites in the San Dieguito Watershed along Lusardi Creek upstream of the site reported herein. Jim Pea reported multiple sighting in the San Diego River and one Clapper Rail behaving like a park pigeon taking handouts in a La Jolla Park by the Bridge Club. Kevin Clark found a Clapper Rail 2 ½ miles inland of Pacific Coast Highway between Bonette and Fousad Roads. Lastly, a Clapper Rail was found dead in Orange County at Alicia Parkway and Kite Hill Drive adjacent to the Laguna Niguel Regional Park and Sulphur Creek Reservoir. The rail apparently flew into something, was not run over by an auto, and tested negative for West Nile Virus.

The Light-footed Clapper Rail population in California crashed in 2008 but perhaps there were more rails than reported herein. Unusual weather patterns appeared to have greatly disrupted the synchronicity of breeding activity 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 five breeding pairs whereas a minimum of 17 pairs nested on the Seal Beach rafts. However, the nest search results at Upper Newport Bay were significantly poor. There was some evidence, based upon call count results repeated over multiple visits to one spot at Newport that the rails weren't calling all at once on any given visit. So there may have been more rails at Newport than reported herein but there is little evidence that they nested in 2008.

Management and Monitoring of Nesting Sites

Nesting was late, sporadic, and greatly reduced in 2008. The 12 nest-searches conducted by 1 - 10 observers at Upper Newport Bay, April 5 through July 24 revealed one-third the number of egg nests found in 2007 which was half of that found in 2006. Only two egg nests were found in 2008. One was predated and the other was very late, still being incubated on July

24. Because of the poor nesting season, no eggs were taken for egg translocation or for the captive propagation program.

Twelve of the 82 rafts available in 2008 on the Seal Beach NWR held Clapper Rail egg nests, and five of these also had second clutches for a total of 17 clutches of eggs. This is reduced from the levels of reproductive activity documented in 2005 – 2007 when total clutches laid were 23, 32, 20, respectively and 15% lower than observed in 2007. There were a total of 20 nests and 18 brood nests built on 37 rafts in 2008. Two clutches were probably incubated in marsh vegetation and brooded to some extent on rafts. Whereas nine brood nests built on rafts in 2005 were indicative of successful nests in nearby natural cover, only one such case was evident in 2008. Since rafts were first deployed in the NWR there has been little evidence of off-raft nesting other than in 2005. Hatching success was 97% in 2008.

The population estimates for the NWR based upon the call counts have been slightly to significantly lower than indicated by call counts augmented by observed nesting activity. Given the nesting season observations, the actual population at Seal Beach has probably been about 24 pairs annually since 2003 (Hoffman 2006). However, based upon reduced nesting activity in 2007 and the low high tide count on October 26, we predicted correctly that the breeding population going into 2008 would be smaller.

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 due to 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 artificial and natural 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 additional predator-protection to increase rail survival and productivity in 2006. Unfortunately, this was not sustained into 2007 and 2008.

The Kendall-Frost subpopulation plummeted by 64% in 2006 from its recent high of 14 pairs in 2004 and 2005 and remained at low levels in 2007 and 2008. Fifteen of the 18 rafts held nests; there was no nesting activity on three of the rafts. There were egg clutches on five rafts, one of which hatched and another may have hatched. All of the remaining clutches were depredated. There were two second clutches, one of which was the only successful hatch. The estimate of two pairs is conservative; however, based upon the location of egg nests and timing, there may have been only two pairs breeding. There was a brood nest in the marsh near one of the rafts. Additionally, Forster's Terns (*Sterna forsteri*) again nested in the outer marsh with

about 200 individuals defending in June.

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 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; it should be a focus of management efforts for rail recovery.

Predator issues that arise cause difficult management dilemmas for the rails. A Cooper's hawk probably caused some of the problems for rails in Kendall-Frost beginning prior to the 2006 breeding season. A large individual was observed launching from the condominiums perfectly positioned hunting perches, speeding low along the main channel, and crashing into the marsh after unseen quarry. A Cooper's hawk was video-taped at Bolsa Chica in 2006 attacking a rail, repeatedly crashing into thick vegetation, and reminding one of how persistent and lethal this species can be. One such regular hunter could take a heavy toll but trapping and relocating raptors is very specialized work and extremely labor intensive. 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 anyway. The Cooper's hawk observed is a large female seen hunting the marsh again in 2008. It would not be surprising if the terns were the hawk's regular fare and the rails incidental victims.

None of the rafts or nesting baskets at the Sweetwater Marsh NWR were used by Clapper Rails for nesting in 2008. However, the new rafts were only installed after the breeding season on October 25. 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 the only one that vocalized in response to the tape on April 18 south of the Nature Center and aviary. An adult was occasionally observed and one chick was seen swimming across the pond on June 11.

Sweetwater Marsh is another elevated marsh that is not influenced by average high tides, except for storm-driven extreme highs. 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 there in 2005 (Zemba 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 early spring call counts in 2008, only five breeding territories were in evidence at Point Mugu along with three unmated males and a female. By the end of the

breeding season further evidence of breeding activity had been discovered in four of those territories. Seven nests were found at Point Mugu in 2008. Two held active incubation nests; four new nests were found; a brood nest was discovered in one territory; and active chick feeding was in evidence in three of the territories.

Again in 2008, the most common evidence of successful reproductive activity at Point Mugu was crab remnants left in territories indicative of chick feeding. Adults feeding young chicks will break apart small crabs that the adults would swallow whole for themselves. Holes are pecked into the carapace of the crab and tiny bill-tip quantities of crabmeat are delivered, bit-by-bit to the chicks. Small, dismembered crabs are left in the marsh at regular feeding spots. The nature of the excavated crabs and other evidence at these sites indicates that chicks were fed there recently. Crab limbs that the adult did not bother to swallow (as they typically do when not distracted by chicks) are usually strewn about, and there are often tracks of young and adults. Sometimes there are downy feathers and regurgitated pellets.

Locating active incubation nests was a much higher priority when egg translocation was the only possible means of introducing Newport genotypes into Point Mugu. Now that the development of a protocol for captive breeding has become more active and successful, the release of captive-reared rails has largely replaced the egg translocations and nest searching has been reduced at Mugu to minimize disturbance to the nesting rails. Point Mugu has been the major target marsh for the release of captive reared rails because it is the largest of the coastal wetlands available to Light-footed Clapper Rails in California.

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. Given the years of experience at Point Mugu with the rails, the new rafts were placed more strategically. Five rafts were placed on March 14 and a rail was incubating eight eggs by early July with a successful hatch by July 28. Two of the other rafts may have had some visitation by rails but there was no additional nesting on rafts. With this initial success, we will place additional rafts in 2009.

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 (Table 3).

Table 3. Clapper Rail Egg, Chick, and Fledgling Production in Captivity, 2001 – 2008.

YEAR	#BREEDING PAIRS	#EGGS	#HATCHED	#FLEDGED
2001	2	15	15	10
2002	3	35	30	21
2003	4	54	43	26
2004	5	58	47	42
2005	4	74	48	36
2006	6	27	10	7
2007	6	37	23	18
2008	6	58	56	46
Total	-	358	272	206

Table 4. Number of Captive-reared Light-footed Clapper Rails Released into Target Marshes, 2001 – 2008.

Marsh	2001	2002	2003	2004	2005	2006	2007	2008	Total
Point Point Mugu	7	11	20	12	17	3	5	27	102
Seal Beach NWR	-	6	-	5	-	-	-	13	24
Sweetwater Marsh	-	4	-	-	11	-	-	6	21
Kendall-Frost	-	-	5	-	-	-	-	-	5
Batiquitos Lagoon	-	-	-	8	8	-	-	-	16
San Elijo Lagoon	-	-	-	8	-	5	4	-	17
Agua Hedionda	-	-	-	5	-	-	-	-	5
Los Penasquitos	-	-	-	4	-	-	4	-	8
Carpinteria Marsh	-	-	-	2	-	-	-	-	2
San Diego River	-	-	-	-	5	-	5	-	10
Total	7	21	25	44	41	8	18	46	210

In 2008, 46 more captive-bred rails were released, 27 into Point Mugu, 13 into the Seal Beach NWR, and six into the Sweetwater Marsh NWR (Table 4). This brings the total number of captive-reared Light-footed Clapper Rails released to the wild since 2001 to 210. Point Mugu remains the priority for releases because of the size of the potential habitat base there but lineages must be watched to avoid swamping the genetic pool at any of the release sites (Table 5).

Sea World officially endorsed involvement in the Clapper Rail Recovery Program early on and completed the construction of an aviary in 2005 to house two pairs of breeding Clapper Rails adjacent to their new educational facility. The plight of the Clapper Rail and the importance of coastal wetlands have been incorporated into their educational program. The educational facility accommodates about 15,000 students per year. Sea World participation has been instrumental in the success of the rail program. When there were predation problems or opportunities to maximize the output of the captive rails, the Sea World Avian Staff were there to do whatever needed to be done. Corporate recognition and the beginning of an educational component are welcomed and exciting additions to the program as was the partnership of the Wild Animal Park in 2005.

The two pens that were used to house the first rails at SeaWorld were refurbished to render them inaccessible to small rodents so they could be used once again in lieu of the educational aviary. The construction was completed in time for the 2008 breeding season. Each enclosure now has a concrete footing around the perimeter. All of the old hard ware cloth was replaced with 1in x ½ in vinyl clad weld wire. The entire back portions of the enclosures were rebuilt with new vinyl clad weld wire. All of the trees in the enclosures were cut down to two feet below the top of the pens and the tops of the pens were also rebuilt with new weld wire.

Since the captivity of the first pair of rails, there has been concern about the level of disturbance caused by visitors. Over 40,000 people go through the exhibit annually, passing within a few meters of the rails' cage. Exposure of the public to the rails, their plight, and the importance of their habitat is a top priority of this program. Although this disturbance could impact the rails, they are breeding and thriving at CVNC.

At Sea World on the other hand, the nature of the constant human activity at the Educational Aviary may have been a component in the lack of reproductive output there in 2007. As a result, Sea World staff determined to move the rails to pens with less human activity. The breeders are now housed in the side pens and successfully bred in 2008.

Table 5. Number by Lineage of Captive-reared Clapper Rails Released into Target Marshes 2003 – 2008 with Summary of 2001 – 2008.

	2003	2004	2005	2006	2007	2008	Total 01-08
Point Mugu	1a14b 5d	6a6d	7a1b9d	1a1e 1w	5e	16e2g1i 5j3k	23a25b20d22e 2g1i5j3k1w
Seal Beach NWR	7wild*	5b	-	-	-	4e1f3g 5h	5b6c4e1f3g5h 7wild*
Sweetwater	-		11b	-	-	4e2g	1a14b4e2g
Kendall-Frost	5a	-	-	-	-	-	5a
Batiquitos Lgn	-	3a2b3d	8b	-	-	-	3a10b3d
San Elijo Lgn	-	1a4b3d	-	5a	4e	-	6a4b3d4e
Agua Hedionda	-	5b	-	-	-	-	5b
Los Penasquitos	-	4b	-	-	4f	-	4b4f
Carpinteria M.	-	2wild		-	-	-	2 wild
San Diego River			2a1b2d	-	5f	-	2a1b2d5f
Total	6a14b 5d7w	10a20b 12d2w	9a21b 11d	6a1e 1w	9e9f	24e1f 7g5h1i 5j3k	40a68b6c28d 34e10f7g5h1i 5j3k10w

*The 7 wild young released into Seal Beach NWR were from eggs taken from Seal Beach during a clutch-swap.

Pair “a” is 716-93332 (CVNC 003 male) X 605-09842 (CVNC 002 female);

Pair “b” is 605-09841 (CVNC 001 male) X 605-09850 (CVNC 004 female);

Pair “c” is 945-65863 (CVNC 017 male) X 945-65856 (CVNC 009 female);

Pair “d” is 945-65854 (CVNC 007 male) X CVNC 052 female (no Service band);

Pair “e” is 183-54489 (CVNC 208 male) X CVNC 052 female.

Pair “f” is WAP 207/197; Pair “g” is WAP 207/246; Pair “h” is WAP 206/209.

Pair “i” is CVNC 219/217; Pair “j” is SW 91/155; Pair “k” is SW 89/218.

The timing of nesting, hatching, and chick rearing are summarized for the Nature Center, Sea World and Wild Animal Park in Tables 6 through 8. The rails housed at the three facilities yielded 10 clutches and 10 broods from six pairs: three pairs had one clutch each; two pairs had two clutches (no hatches from one); and the final pair had four clutches.

Footnotes and remarks on Sea World reproduction are as follows. *Pair LFCR091/155 had a possible second clutch. Two eggs were found, both with small punctures. Neither had development and one appeared old. 5/7/08 - Chick LFCR261 found dead in pool. Keeper was unable to get a good visual on all other chicks. Parents are very defensive. 5/8/08 – Clear visual on 4 chicks. LFCR262 found dead in nest. 5/12/08 – LFCR263 found dead in aviary. 5/13/08 Remaining chicks were pulled and puppet feeding was attempted. Chicks wouldn’t eat from

puppet or dishes and made distress calls until returned to parents. LFCR264 went missing in the conditioning pens at CVNC and presumed dead. All six chicks that hatched from this clutch were parent reared until moved to conditioning pens at Chula Vista Nature Center. The only rail chick from this clutch not to get transferred to Chula Vista Nature Center was a bird that was flushed into a support pole and died in the lab. This occurred on 8/8/08. One egg didn't hatch and was later found in a second nest location. This egg showed no signs of development.

Generating public awareness of the plight of the Light-footed Clapper Rail and their connection to salt marsh habitat is an important aspect of the activities associated with breeding and release efforts. CVNC, SWC, and WAP have developed programs and educational opportunities to increase public awareness of this endangered bird. CVNC exhibits the rail, allowing 40,000 to 60,000 guests a year to see the elusive, secretive bird up-close. SWC has brought the story of the Light-footed Clapper Rail into the homes of millions by featuring the rail and reintroduction efforts on their educational television series *Shamu TV*. SeaWorld and Bush Gardens have also facilitated featuring the rail on a segment of *Jack Hanna's Animal Wise*. WAP describes their breeding efforts in several of their web site blogs. The web site stories have been effective in generating awareness and concern for the rails and their habitat. A great example of these far reaching effects were the calls and emails San Diego Zoo staff fielded during the San Diego wildfires in October 2007. Concerned individuals, even some from out-of-state, inquired about the fire-threat to the habitat of the released captive bred rails and whether the rails survived the fires.

Another aspect of the program that creates public awareness is the involvement of local volunteers for Light-footed Clapper Rail studies and reintroduction efforts. We have always made an effort to incorporate people who live near a wetland in a variety of activities like censuses, artificial nest construction and maintenance, rail releases, and even radio telemetry tracking. Including residents of nearby wetlands has resulted in increasing their sense of "ownership" of the resource and their willingness to be stewards and advocates for wetlands and the Light-footed Clapper Rail.

Table 6. Clapper Rail Breeding Activity at Sea World, 2008

Parent IDs	091/155	091/155	089/218
Clutch # (1 ST 2 ND)	1 st	2 nd	1 st
Date Clutch Initiation	4/5/08	~6/17/08	5/16/08
Date Clutch Completion	4/13/08	6/18/08	5/24/08
# Eggs	6	2 *	7
Incubation Initiation	~4/13/08	N/A	~5/24/08
Hatch Dates (# eggs)	5/7/08	N/A	6/12/08 (4) 6/13/08 (2)
# Eggs Hatched	6	N/A	6
# Chicks 1 wk old	3	N/A	6
# Chicks 2 wks	3	N/A	6
# Chicks 3 wks	2	N/A	6
# Juveniles Moved To Conditioning Pen	2	N/A	5
Age of Juveniles When Moved	71 days	N/A	71 days
# Juveniles Released To Wild	1	N/A	5
ID of Released Clapper Rails	LFCR265	N/A	LFCR303 LFCR304 LFCR305 LFCR306 LFCR308
Age at Release	107 Days	N/A	126 Days
Release Location	Mugu	N/A	Seal Beach

Table 7. Clapper Rail Breeding Activity at the Chula Vista Nature Center, 2008

Parent ID	208/052 Male/Female		208/052	208/052
Clutch #	Clutch 1	Clutch 2	Clutch 3	Clutch 4
Clutch Initiation	2/18/08	3/31/08	5/14/08	6/7/08
Clutch Completion	2/27/08?	4/10/08	5/22/08	6/15/08
# Eggs	8	8	7	6
Incubation Initiation	unknown	4/9/08?	unknown	unknown
Hatch Dates (# eggs)	3/18/08 3/19/08	5/2-5/4/08	6/13/08 clutch artificially incubated	7/6/08
# Eggs Hatched	8	6	6	6
# Juveniles Moved To Conditioning Pen	7	5	6	6
Age of Juveniles When Moved	~ 39 days	76-78 days	48 days	71 days
# Juveniles Released To the Wild	7	5	6	6
ID of Released Clapper Rails	LFCR 223 - 227			LFCR 231 - 234
Age at Release	~ 99 Days of age			~79 days
Release Location	Mugu Lagoon			San Elijo

Table 8. Clapper Rail Breeding Activity at the San Diego Zoo Wild Animal Park, 2008.

Parent IDs	Male/Female 207 / 246	Male/Female 206 / 209
Clutch #	1st	1st
Date Clutch Initiation	~29 Apr	~8 May
Date Clutch Completion	~5 May	~17 May
# Eggs	6	6
Date Incubation Initiation	~2 May	~14 May
Hatch Dates (# eggs)	~28–30 May	~4–6 June
# Eggs Hatched	6	4
# Chicks 1 wk old	6	4
# Chicks 2 wks	6	4
# Chicks 3 wks	6	4
# Juveniles Moved To Conditioning Pen	6	3
Age of Juveniles When Moved	~50 days (July 17 th)	~43 days (July 17 th)
# Juveniles Released To the Wild	6	3
ID of Released Clapper Rails	#267 - 272	#273, 275, 276
Age at Release	102-104 days	97 days
Release Location	Seal Beach (1) Mugu (5)	Mugu (Aug 22)

The captive breeders in 2008 were the same rails at the same facilities as in 2007 except for the female #197. As noted above she was the only casualty in fire evacuations from the Wild Animal Park on October 22. She has been replaced with a female, band #103544924 caught in Upper Newport Bay on November 25, 2007. The same breeders will be used again in 2009.

Banding and Telemetry

There were no banding sessions conducted at Upper Newport Bay in 2008. The primary purpose for trapping at Newport in recent years has been to refresh the captive flock. Old breeders will typically be replaced with young raised from wild eggs, alleviating the need for trapping adults out of Upper Newport Bay. No eggs were taken from Newport in 2008 because breeding activity was at an alarmingly low level.

Forty-four of the 46 rails released into the wild from captivity were banded but none was fitted with a radio transmitter in 2008. Two of the rails escaped into the Sweetwater Marsh prior to being banded. The 2008 band combination was anodized blue metal band on the right leg and the Service Band on the left. USFWS band numbers on the rails released to Point Mugu were: #103544926 – 103544930 on June 24; and #104521702 – 104521707 and #106539801 – 106539816 on August 22, 2008. Those released in Seal Beach were banded 106539817 – 106539823 on October 16 and 106539824 – 106539829 on November 2. The rails released into Sweetwater intentionally wore bands #1065-39830 – 106539833.

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