CALIFORNIA CLAPPER RAIL

Rallus longirostris obsoletus
USFWS: Endangered
CDFG: Endangered

Species Account

Peter La Tourrette

Status and Description. The California clapper rail (*Rallus longirostris obsoletus*) was listed as a California State Endangered Species on June 27, 1971 (CCR Title 14, Section 670.5) and Federally on October 13, 1970 Endangered (Federal Register 35 - 1604). The California clapper rail is one of three subspecies of clapper rail listed as endangered under both State and Federal Endangered Species Acts (the others are the light-footed clapper rail, *R.l. levipes* and Yuma clapper rail, *R.l. yumanensis*, both inhabiting southern California). Adult rails are 33 to 48 centimeters in length with a bill length of at least 5 centimeters. The California clapper rail is generally gray-brown above and buffy-cinnamon below, with brownish-gray cheeks and black-and-white barred flanks. Their bill is long, slightly down-curved, and somewhat orange in color. The species has a short neck and a short tail cocked upward, revealing a white patch. Overall, the California clapper rail is the size of a coot and is slightly larger and grayer than the two southern subspecies (CDFG 2000).

Range, Populations and Activity. The historic range of the California clapper rail extended within the coastal California tidal marshes from Humboldt Bay southward to Elkhorn Slough and Morro Bay, and estuarine marshes of San Francisco Bay and San Pablo Bay to the Carquinez Straight. Historically, the highest densities of California clapper rails existed in south San Francisco Bay. Sport and market hunting reduced population numbers in the late 19th and early 20th centuries, until 1913, when clapper rail hunting was prohibited by the Migratory Bird Treaty Act. Since then, loss and alteration of tidal marshes for salt ponds, agricultural land, and bayfill, have been the major causes of their population decline. Of the 193,800 acres of tidal marsh that bordered San Francisco Bay in 1850, only about 30,100 acres remain, which amounts to an 84% reduction from historical conditions (Dedrick 1989).

Resident clapper rail populations are currently limited to San Francisco Bay, San Pablo Bay, Suisun Bay, and tidal marshes associated with estuarine sloughs draining into these bays. When first considered an endangered species, populations of California clapper rails were estimated at 4,200 to 6,000 individuals (Gill 1979). Based on winter high tide counts from 1996-97, the South and North Bay populations have been reduced to an estimated population of 500-600 birds each (CDFG 2000). This latter decline has been attributed to the introduction and spread of the red fox (*Vulpes vulpes*) in the marshes surrounding the Bay. Following implementation of predator control programs for red fox and other predators on the San Francisco Bay National Wildlife Refuge and adjacent baylands, rail populations have rebounded to an estimated bay wide population in the range of 1040 to 1264 rails by 1999, of which an estimated 650 to 700 were located in the South Bay (C. Wilcox, DFG, pers. comm.). More current data shows the clapper rail populations in the South Bay to be holding fairly steady at 500 to 600 birds (Albertson, USFWS, pers. com.). The current overall trend for clapper rail population levels in Central San Francisco Bay, San Pablo Bay, and Petaluma River marshes also

generally show increased numbers; however, the rails appear to be declining or absent from many smaller, isolated marshes (Liu et al. 2005).

In the San Francisco Bay area, California clapper rails breed from mid-March through July, with peaks observed in early May and late June (Gill 1973, Harvey 1980). Clutch size averaged 7.6 in northern California and hatching success is approximately 38% in the San Francisco Bay area (Harvey 1980). Both the male and female incubate the eggs for approximately 18-29 days.

In saline emergent wetlands, California clapper rails nest mostly in lower zones near tidal sloughs and where cordgrass (*Spartina foliosa*) is abundant (Harvey 1980, Zembal and Massey 1983). Clapper rails build a platform concealed by a canopy of woven cordgrass stems or pickleweed and gumweed (Harvey 1990). Nests are constructed only as high as necessary to prevent inundation while preserving a natural cover of vegetation. Clapper rail nests are described as a mass or heap of vegetation, deeply cupped and securely woven to the surrounding vegetation that allows for flotation during extreme tidal events. Zucca (1954) discovered that although the nests are somewhat buoyant, they do not remain intact through a series of high tides. Clapper rails also use dead drift vegetation as a platform (Harvey 1990). The vegetation used to construct clapper rail nests is partly determined by the time of the nesting and the tidal influence (Zucca 1954). In fresh or brackish water, clapper rails construct nests in dense cattail or bulrush (Harvey 1990).

California clapper rails forage in higher marsh vegetation, along the vegetation and mudflat interface, and along tidal creeks. They feed by gleaning, pecking, probing, and scavenging from the surface (Harvey 1990). Clapper rails often feed by walking a few steps, thrusting their beaks into the mud up to eye level, then walking a few more steps, and then repeating the probing (Wilbur and Tomlinson 1976). Along the coast, clapper rails prey on crabs, mussels, clams, snails, insects, spiders, and worms (Harvey 1990). California clapper rails also eat mice during high tides, and may scavenge dead fish (Zembal and Massey 1983). In a study by Moffitt (1941), the volumetric content of California clapper rail stomachs averaged over 85% animal matter and 14.5% vegetable matter. Plaited horse mussel (*Modiolus volsetta demissus*) was the most prominent food item at 56.5% stomach content. Remaining stomach contents included spiders (15%), macoma clams (7.6%), mud crabs (3.2%), and bones from brush rabbits. The bones of brush rabbits were assumed to be remains from carrion.

Clapper rails mostly vocalize during the night (Harvey 1990). These vocalizations are used by clapper rails to defend their nesting territories (Albertson 1995).

Habitat Use. California clapper rails inhabit tidal salt and brackish marshes of the greater San Francisco Bay (CDFG 2000). They prefer tall stands of pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*) but are also associated with gumplant (*Grindelia* spp.), saltgrass (*Distichlis spicata*), alkali heath (*Frankenia grandifolia*), and jaumea (*Jaumea carnosa*) in high marshes and pickleweed, cordgrass, and bulrush (*Scirpus* spp.) in the north bay (Grinnell *et al.* 1918, DeGroot 1927, Harvey 1988, Collins *et al.* 1994). The brackish wetland habitat occurs in the South Bay, parts of Napa Marsh, Petaluma River, and Sonoma Creek in San Pablo Bay, and in Suisun Bay (Gill 1979). California clapper rails prefer habitats containing marshes supporting tidal sloughs that provide direct tidal circulation throughout the area. They also require shallow water and mudflats with sparse vegetation and abundant invertebrate populations for foraging habitat, and escape routes from predators (Zembal and Massey 1983, Foerster *et al.* 1990). Higher elevation marshes are

utilized for nesting habitat and refuge from high tides (DeGroot 1927, Harvey 1988, Foerster *et al.* 1990, Evens and Collins 1992, Collins *et al.* 1994).

Local population densities of California clapper rails are greater in habitat that is at least 100 hectares in size. Locations of the marsh in relation to other marshes, buffer areas between marsh and upland areas, marsh elevation, and hydrology also affect densities of rails (Collins *et al.* 1994, Albertson 1995, Garcia 1995). In addition, Evens and Collins (1992) found rail densities to be lower in more brackish habitats brought forth by freshwater outflows; this lower density was possibly due to the resulting change in vegetation. In the San Francisco Bay area, breeding season density was 0.3 to 1.6 per hectare (0.1 to 0.6 per acre) (Gill 1979). Density in non-breeding seasons varied from 0.1 to 1.1 per hectare (0.04 to 0.4 per acre) (Gill 1979).

Population Levels and Occurrence in Plan Area. California clapper rails are associated with the Coastal Marsh vegetation type located in the Plan Area Coastal Marsh Natural Community. A total of 22 current records of California clapper rail have been reported from Solano County (CNDDB, 2011) The status of the clapper rail in Suisun Marsh is unknown. Surveys by Liu et al. (2005) did not detect any clapper rail breeding activity at five survey stations, but the entire marsh area was not surveyed. California clapper rails have periodically occurred at several sites in Suisun Bay, indicating that populations are present some years and not others (Albertson and Evens 2000). The first record of California clapper rails extending their range into the Suisun Marsh occurred in 1978 with the detection of individuals at Cutoff Slough (Harvey 1980). The species has also been detected in the shoreline marshes from Martinez east to Point Edith, near the mouth of Goodyear Slough, and upper Suisun and Hill Sloughs (Albertson and Evens 2000). Other areas of Suisun Bay known to have clapper rails include the First and Second Mallard Branches, Concord Naval Weapons Station, Rush Ranch, Suisun Marsh Reserve Fleet, Ryer Island, Boynton Slough, McCoy Creek, Union Creek, and Morrow Island.

Winter records are greater in Suisun Bay than are breeding season records. This change in use is probably due to the changes of these marshes to more brackish conditions caused by a decrease in freshwater flow from the Sacramento-San Joaquin Delta (Rozengurt *et al.* 1987, Evens and Collins 1992, Leipsic-Baron 1992).

Dispersal. California clapper rails are not migratory, but post-breeding dispersal has been recorded in late fall and early winter (Orr 1939, Wilber and Tomlinson 1976). Harvey (unpubl. data) recorded three of 54 banded clapper rails migrating distances of approximately one to ten kilometers. However, the majority of birds (78%) were found within 500 meters of where they were banded. Albertson (1995) recorded one clapper rail moving three kilometers in the early breeding season. In general, clapper rails appear to move very little between seasons and between nesting or core-use territories (Albertson 1995). Clapper rails tend to be more dispersed within the marsh following the nesting season, although the preferred habitat continues to be marsh dominated by cordgrass.

Threats to the Species. Several human-related factors have and continue to threaten California clapper rails. Until the Migratory Bird Treaty Act was passed in 1913, commercial and sport hunting were significant factors in the species' decline in the late 1800's (DeGroot 1927, Wilber and Tomlinson 1976, Gill 1979). Since then, the loss and alteration of tidal marsh habitat have been the major threats to populations of California clapper rails. Tidal marshes in the San Francisco Bay have been reduced by 84% since historical times (Dedrick 1989). Although the loss of tidal marsh habitat

through filling and diking has largely been curtailed, other current factors associated with declining populations of the California clapper rail include the conversion of salt marshes to brackish marshes due to freshwater discharges from sewage treatment plants, a progressive rise in sea level, invasion of non-native cordgrass, predation by nonnative species such as the red fox, and pollution from urban runoff, industrial discharges, and sewage effluent (Williams 1985, Moffatt and Nichol *et al.* 1987, Ohlendorf and Fleming 1988, Ohlendorf *et al.* 1989, Harvey 1990, Lonzarich *et al.* 1990, Foerster and Takekawa 1991, Leipsic-Baron 1992, CDFG 2000).

California clapper rails are subject to heavy predation from nonnative species such as red fox, feral cat (*Felis domesticus*), and Norway rat (*Rattus norvegicus*) as well as various native mammals and raptors (Foerster *et al.* 1990, Albertson 1995, CDFG 2000). The fragmentation of habitat has increased predation of clapper rails because terrestrial predators utilize dikes and levees as corridors to access those habitats where clapper rails reside (Foerster *et al.* 1990, Burkett and Lewis 1992). Urban development adjacent to marshland habitat has increased predation by native predators such as raccoons, which thrive in urban areas, and raptors, which utilize electric power transmission lines as hunting perches (USFWS 1999). Shoreline riprap favors populations of Norway rats, which in turn could increase their take of clapper rail eggs in certain marshes (DeGroot 1927, Harvey 1988, Foerster *et al.* 1990, USFWS 1999). Non-native red foxes may pose as the most serious threat to clapper rail populations (USFWS and USN 1990, Foerster *et al.* 1990, Foerster and Takekawa 1991, Zembal 1992, Albertson 1995). Red foxes have not been detected in the Suisun marsh area, which is most likely due to the common occurrence of coyotes (*Canis latrans*) in the area (Albertson and Evens 2000). River otters (*Lutra canadensis*) are common in the Suisun Marsh area and could also prey on eggs of clapper rails (Ingles 1965, Albertson and Evens 2000).

The suitability of marshland habitat for clapper rails is further limited by their small size, fragmentation, and lack of tidal channel systems and higher refuge areas. Many tidal marshes are completely submerged during high tides and provide insufficient cover, likely resulting in nesting failures and high rates of predation (Zucca 1954). Additionally, tidal amplitudes are much greater in the South Bay than in the San Pablo or Suisun bays (Atwater *et al.* 1979). Due to increased predation rates, potential stochastic events, and possibly a lowered fecundity (Foerster *et al.* 1990), isolated, small populations of clapper rails in fragmented habitats are unstable and tend toward extinction (Albertson and Evens 2000).

Conservation Issues. Evens and Collins (1992) found clapper rail densities to be positively related to the extent of saline habitat, with breeding distributions restricted to areas with salinity greater than marginal. The same study also showed that rail densities decrease with distance upstream. The primary threats to the species are habitat loss and predation by nonnative species such as red fox and rats.

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