

Mystery of the Marsh: The California Black Rail

by Jules Evens

Rarely heard and even more rarely seen, this quail-like bird, about the size of an Easter chick, scurries through the salt marsh vegetation, scarcely ever revealing itself. Nor should it. During 15 years of research in the tidal marshes of San Francisco Bay, I've actually seen only a few dozen black rails (*Laterallus jamaicensis coturniculus*). Most often these sightings occur moments before a predator, usually an egret or heron, snatches it from the edge of the marsh.

As the small bird struggles in the beak of the larger bird, I get a fleeting glimpse of the plumage - charcoal and chestnut, lightly speckled with white - that identifies the prey as a black rail. Then it's gone; down the gullet. "Secretive," "furtive," "elusive" are a few of the adjectives used to describe the California black rail. I'd add also "mysterious" to the list of modifiers.



Photo by Rich Stallcup

The first record of this bird for California was of a single individual apparently collected on the Farallon Islands in 1859, more than 20 miles from the closest marsh. Based on a few sightings and specimens of birds collected from flooded marshes, naturalists in the mid 1940's understood that the little black rail was confined chiefly to salt marshes bordering large bays on the California coast. These marshes ranged from Tomales Bay in Marin County to San Diego County. Over the next half century, those coastal marshes would be so drastically altered by the burgeoning human population that by mid-century the black rail was considered "extirpated" from coastal Southern California. Its status elsewhere was not well understood.

A statewide survey conducted in the 1970's suggested that the marshes of San Francisco Bay probably supported the bulk of the black rail population in California. Although small populations have also been found outside San Francisco Bay, (in outer coast tidal marshes, small pond margins and swales in the low Sierra foothills, freshwater marshes associated with the Colorado River and the Salton Sea) the habitat available at all these sites combined provides less than 10% of the marshland that occurs within San Francisco Bay. The total number of California black rails outside of San Francisco Bay must be low, perhaps several hundred individuals.

In the course of other avian research within the bay, shorebird biologist Gary Page, other associates at Point Reyes Bird Observatory, and I had encountered black rails fleetingly and had become curious about this mysterious little marsh dweller. We knew

that because of the severe modifications imposed on shoreline habitats of San Francisco Bay over the past 150 years, it was likely that any species that was dependent on marsh habitats had suffered dramatic declines. Many of the same factors that have caused other marsh dependent species, such as the California clapper rail, salt marsh harvest mouse and soft bird's beak to be classified as "threatened" or "endangered," must also negatively influence the black rail population. Several other species, such as the salt marsh common yellowthroat, Suisun song sparrow and San Pablo song sparrow are candidates for the endangered species list.

In mid-1980's the Marin Audubon Society and the California Department of Fish and Game funded a few small studies to help us address some questions key to conservation biology. How many black rails reside in the San Francisco Bay estuary? Where exactly are they? What are their habitat requirements?

From 1986-1988 we surveyed 78 discrete marshes in the Delta, Suisun Marsh, San Pablo Bay, Central Bay and South Bay during the breeding season (March-June). Because the birds are so covert, we played tape recordings of their vocalizations - an emphatic, cricket-like "kic-kik-kerr," or a mechanical "grrring" sound - to elicit responses. Estimating numbers of birds by sound presents many confounding problems and it is difficult to come up with an exact number of birds present. But, we did derive an index to estimate relative abundance among marshes. (We are still working on this thorny problem.) We discovered, to our surprise, that almost all territorial black rails were confined to the North Bay, with a majority in the San Pablo Bay system. The Suisun marshes also held a fair share of birds, but black rails were virtually absent as a breeding species in the Central and South bays. The one site where black rails were found within the South Bay was in the Don Edwards San Francisco Bay National Wildlife Refuge's large Dumbarton marsh.

Having figured out where they were (and where they weren't), the next logical question was: What are the habitat characteristics of those marshes that support black rails and how do they differ from sites where the birds do not breed?

Old records indicate that black rails formerly nested in the South Bay, as well as the coastal marshes of Southern California. But for all intents and purposes, they have disappeared as a breeding species. Black rails do occur in the South Bay during the winter months, however. For many years, birders have seen black rails clinging to emergent marsh vegetation at Palo Alto Baylands during the winter flood tides. Often the observers report that the rail is picked off by a hawk, heron or egret. We assume that most of these winter birds are juveniles that have dispersed to the South Bay after being reared in the North. If they don't survive into the breeding season because of high mortality (predation, drowning, or other factors) the South Bay would be regarded as a "population sink," an area where more birds die than survive. There is also a possibility that rails winter in the South Bay and breed in the North Bay. We have no evidence of this, however; another mystery yet to be solved. We think we understand why they don't breed in the South Bay: There is simply not enough habitat above mean higher high water. In the South Bay, subsidence has caused more and more marsh lands to

be flooded on high tides. Simultaneously, levees and roads constructed on the upland edge of these sinking baylands effectively eliminate most of the higher marsh habitats. The North Bay marshes are somewhat higher in elevation. But marsh elevation alone does not explain why rails in the North Bay have clustered distributions. Rails were much more commonly encountered in fully-tidal marshes than in marshes with restricted tidal flow, in marshes along large tributaries or along the bayshore than in smaller tributaries, and in marshes located at the mouths of sloughs and creeks.

Prime black rail habitat is that thin ribbon of salt marsh vegetation that occurs between the high tideline (mean higher high water) and the upland shore, a gently sloping plain with very little elevational rise. Since the Gold Rush, the high tidal marsh may have been the most altered habitat in San Francisco Bay. A study in the late 1970's determined that high salt marsh habitat averaged only about three meters in width. Along the tideline we have built levees and dikes, salt ponds, roads, factories, landfills, bike paths, parking lots and sewage treatment plants. In the Central and South bays, bayfill has been added to the shoreline to build the cities of San Francisco, Oakland, Redwood City, and Fremont. In the North Bay conversion to agriculture has been the primary culprit.



Black Rail Habitat
Photo courtesy of Jules Evens

One of the primary threats to high marsh inhabitants is the condition of the habitat just above the tideline, the natural vegetative transition between the tidal marsh plane and the adjacent upland that serves as a buffer zone and provides refuge during periods of flooding. Although these flood tides are relatively rare, they present a period of high vulnerability to rails (and mice and shrews) who, for a period of several hours at a time, are refugees from their preferred habitat. The frequency of flooding has increased in recent years and, by all indication,

will increase in the future. The increased height and duration of tidal inundation are caused by several factors acting in concert: rising sea level (more than one meter in the last 100 years), marsh subsidence from filling and ground water extraction, heavy rainfall associated with El Niño, and greater retention time of flood waters exacerbated by more roads, levees, and urban development along the bayshore. As the size of the bay is decreased, the volume of water has less area to inundate, so the depth becomes greater. This effect is amplified during severe storm events.

When forced out from the protective cover of pickleweed, salt grass, sedge and other marsh vegetation by rising water levels, the birds take refuge beneath whatever overhead cover they may find on the upland edge of the tideline. Historically, the transition zone was heavily vegetated with overhanging willows, coyote bush, and perennial bunchgrasses. Now the upland edge is more often a rip-rapped levee grazed to the nub, or salt ponds bound by barren dirt levees or shoulders of a four-lane

highway. Those few sites where the transition zone approximates natural conditions (large tracts of marsh with adjacent wildlands like the Petaluma River marsh, the Suisun marshes, and Don Edwards San Francisco Bay National Wildlife Refuge) have become all the more valuable to the remaining populations of black rails.

Under the auspices of the National Biological Survey we conducted a follow-up study in 1996 to try to determine the stability of black rail populations at selected marshes. Our findings were mixed. We had similar to slightly higher detection rates in San Pablo Bay and Suisun marshes. However, none of the marshes that had been "empty" in the earlier study were colonized in the ensuing years. Some of the more isolated, outlying marshes showed declines. The population, therefore, appears to be stable at some of the "core" sites, but possibly declining at the margins.

What threats do these remnant populations face? What does the future hold? The remnant tidal marshlands of San Francisco Bay occupy only 15% or less of their historic area, yet even in such diminished capacity encompass 90% of all remaining California tidal marshes. Besides direct loss of habitat, other threats that could potentially alter or degrade tidal wetlands include freshwater inflow diversions from the North Bay, progressive rises in sea level, and toxic agent contaminations that have been shown to have adverse biological effects on other birds in the estuary. Indeed, during the course of our studies several oil spills occurred in bayshore marshes in Suisun Bay.

The trend in land-use policy around San Francisco Bay, and much of the rest of the country, is toward marsh restoration and wetland enhancement. As the pressures of urbanization and human economics inevitable increase, the habitat values of fully protected marshes will also increase. As wetlands are restored to their natural functions, the inclusion of a zone of transitional upland vegetation around the marsh periphery may insure that as rails colonize these new sites, they may be able to persist and maintain viable populations.

About the author: *As a field biologist, Jules Evens has conducted studies in Bay Area wetlands since the early 1980's. He is currently engaged in the assessment of habitat requirements for a variety of bird species, developing habitat restoration and management plans, and monitoring wetland restoration projects. He is the author of The Natural History of the Point Reyes Peninsula and has written articles on a variety of subjects. Jules is a research associate of Point Reyes Bird Observatory and Audubon Canyon Ranch and has his own consulting business, Avocet Research Associates. He can be contacted via E-mail at avocetra@aol.com*