The California Clapper Rail and Multispecies Recovery Planning

by Michael Casazza, Cory Overton, Melissa Farinha, John Takekawa, and Tobias Rohmer

The California clapper rail (*Rallus longirostris obsoletus*) lives in remnant tidal marshes of San Francisco Bay, where less than 20 percent of the historic tidal wetlands remain. Listed as an endangered species in 1970 by the Fish and Wildlife Service (FWS), this enigmatic bird faces a myriad of threats, including habitat loss due to urban encroachment, sea-level rise caused by climate change, alteration of native habitats by invasive plants, non-native predators, and exposure to mercury and other pollutants. The FWS is in the process of revising the existing recovery plan for California clapper rails and is including

USGS biologists place a small radio transmitter on an endangered California clapper rail to track its movements.

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the rail in a multispecies recovery plan directed towards imperiled salt-marsh ecosystems. Sound scientific information is critical to the success of any recovery plan, but even more so when dealing with complex multiple-species interactions within an ecosystem.

Secretive and wary, rails are a challenge for biologists to observe and study. In 2007, U.S. Geological Survey (USGS) scientists worked with the support of the FWS, State Coastal Conservancy, and East Bay Regional Parks to initiate a project using radio-telemetry to examine aspects of the ecology of the California clapper rail in San Francisco Bay marshes. The initial study focused on home-range size, habitat requirements, survival rates, breeding success, and movement patterns. The birds were captured using a variety of techniques, including drop-door traps, flushing the birds into open water and plucking them from the bay with salmon nets, or simply capturing the birds by hand. The rails were then fitted with tiny backpack transmitters.

Radio-tracking was an essential tool to study these elusive birds as they travel through the dense vegetation and intricate tidal marsh channels, which criss-cross the marsh like a spider web. Locations of rails could be monitored from over a kilometer away. The transmitters were equipped with sensors that indicated whether or not each bird was alive, enabling each bird's survival to be closely monitored. Rails were tracked daily across tide cycles, often multiple times each day, to better understand the relationship between habitat use and movements with respect to tides. Frequent monitoring also allowed scientists to identify predators, such as raptors, introduced red foxes (*Vulpes vulpes*), raccoons (*Procyon lotor*), and feral cats (*Felis catus*). Rail transmitters were recovered from unusual locations, including the nest of a northern harrier (*Circus cyaneus*), under several inches of soil (where it was presumably buried by a fox), and at a feeding station for a feral cat along the bay shoreline. The identification of major predators supported FWS recovery planning by providing solid evidence to guide predator-management strategies.

Another aspect of this ongoing study examines habitat relationships. Scientists use a highly accurate global positioning system to map tidal channels and model the habitat use of radio-marked rails in relation to the location, width, and depth

A California clapper rail fitted with a backpack radio-transmitter and ready for release back to its tidal marsh home.

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Stalking a wary California clapper rail in a tidal marsh.

of these channels. Home ranges are being calculated for each radio-marked bird during breeding, post-breeding, and wintering periods. Together with information about annual movement, this information will help managers understand how much habitat these birds need to survive as well as determine how population densities vary with different habitat structure.

The results from this research program are providing new, detailed information about the clapper rail, which can be applied to a multi-species recovery plan being established for the remaining tidal wetlands of the San Francisco Bay region. The data will be integrated with findings for other endangered tidal marsh species, such as the salt marsh harvest mouse (*Reithrodontomys raviventris*). Future recovery efforts may include potential reintroduction of rails to restored marshes, a goal that not long ago seemed highly unlikely. By increasing our knowledge of the movements and ecology of California clapper rails, we hope to provide the foundation for the continued protection and recovery of other tidal marsh species and their native habitats.

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