Floating Islands Provide Habitat for Highly Endangered California Clapper Rail

Project Location: Oakland, California USA

A study currently underway suggests that floating islands (floating treatment wetlands or FTWs) provide critical habitat for endangered clapper rails. FTWs offer an effective habitat alternative to traditional islands or marshes, as they provide upland roost habitat during fluctuating tides and sea levels.

It appears that the natural process of island formation will not keep up with the forecast increase in tidal sea levels due to climate change. Options for providing tidal marsh and delta island habitat for wildlife dependent upon these habitat features are to:

1. Build/rehabilitate existing islands to increase their height, or
2. Build/deploy FTWs.

Background

The California Clapper Rail, a chicken-sized bird that rarely flies, is found principally in California's San Francisco, Monterey and Morro Bays. Population levels are precariously low due to destruction of its coastal and estuarine marshland habitat for land development and shoreline fill. Recent estimates of its current population and survival rate indicate a high likelihood of extinction.

Under recent climate change scenarios, sea levels may rise as much as 1.9 m (6.2 ft) in San Francisco Bay by 2100. For species such as the California Clapper Rail that require a tidal marsh environment, large changes in water levels may inundate its primary habitats and further threaten its existence.

A project team was assembled by the U.S. Geological Survey (USGS) to address this issue. Project goals were to examine the:

1. Effects of future sea level rise on the California Clapper Rail,
2. Potential for improving high-tide habitat, and
3. Effects of invasive weed control.

Arrowhead Marsh Project

Arrowhead Marsh in Oakland's Martin Luther King, Jr. Regional Park was selected as the project site. Ten floating islands (FTWs) were deployed in September 2010. Each FTW measures 2 m x 3 m (6.6 ft x 9.9 ft), is constructed of recycled plastic bottle materials, and is covered with woven palm screens ("duck blind" material) to provide cover. Plastic bird avoidance spikes were installed on two islands in January 2011 to deter use by predatory birds. FTWs were supplied by Floating Island International Inc. (FII) and Floating Islands West (FIW).

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Waterproof digital cameras, with time lapse capability and motion sensors, were set up on each island. A sub-sample of 11 rails was radio-marked and located weekly to examine survival and area use. The project is documented on the USGS web site, www.werc.usgs.gov. Project updates are available at this site.

Preliminary Results

Use of FTWs by the California Clapper Rail has thus far exceeded expectations. The USGS team reports that clapper rails at Arrowhead Marsh have quickly adapted to the presence of FTWs, with all ten islands receiving moderate-to-heavy use from a clapper rail population estimated at 30-40 birds. Island use by the birds tends to coincide with diurnal high tides, suggesting that the FTWs are being used for habitat when the marsh is mostly or completely inundated.

The California Clapper Rail (Wikipedia photo)

Implications of the findings to-date are that roosting habitats may be limited for clapper rails, not only during king tides (especially high tides) and periods of extreme elevation, but even during daily tides in the winter. Elevated areas, FTWs or levees may be used by clapper rails if located within their home range. Restored areas may be missing key features such as areas above the highest water tides, resulting in less use and lower survival by species vulnerable to predation such as the California Clapper Rail.

Possible sea level rise suggests that habitat management is critical to protect the California Clapper Rail and other species requiring marsh habitat. Sea level rise is likely to exceed natural island formation in many San Francisco Bay marshes, especially after the next few decades. The USGS study indicates that adaptation for sea level rise should include:

- Selection of marshes with the best habitat for clapper rails, and
- Management for habitat elements, including elevated islands or FTWs that provide clapper rails with adequate cover.

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One of the FTWs installed at Arrowhead Marsh (USGS photo)

More of the Arrowhead Marsh project (USGS photo)

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Locations of the ten FTWs at Arrowhead Marsh (USGS photo)

California Clapper Rail inside one of the FTWs (USGS photo)

For more information on these floating island systems, contact Laddie Flock at *laddie@floatingislandswest.com* or 866-798-7086.

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