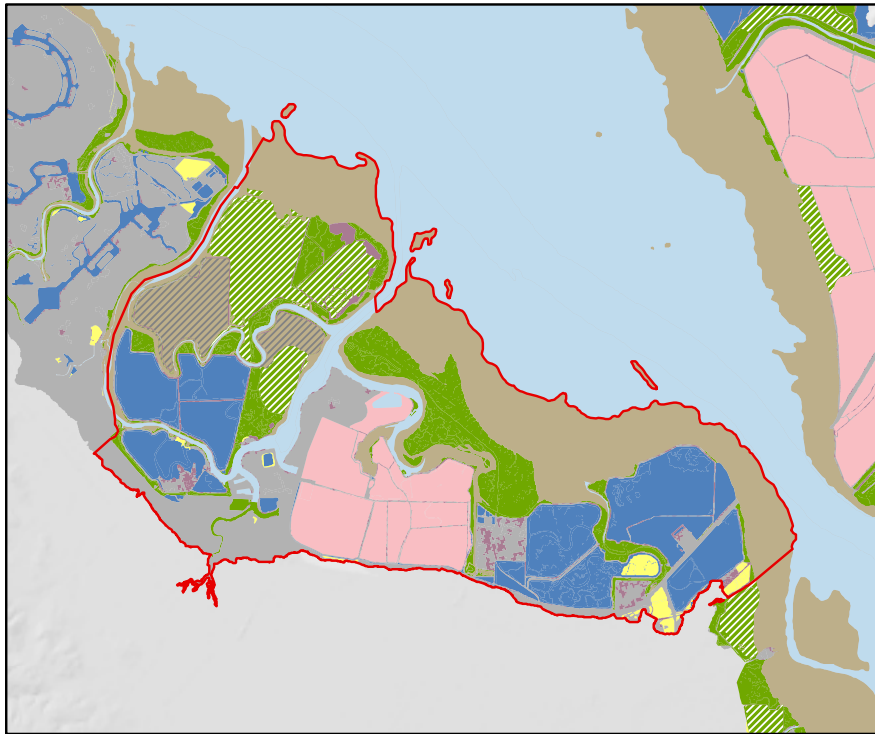


BAYLANDS SEGMENT N



REDWOOD CITY AREA

Western edge of San Francisco Bay between Steinberger Slough and the Dumbarton Bridge

Baylands 2009

- Bay/Channel
- Diked Wetland
- Salt Pond
- Managed Pond
- Tidal Flat
- Tidal Marsh
- Agriculture and Other Undeveloped Areas
- Developed Areas

Red line shows the boundaries of Segment N.

Hatching indicates areas where restoration activities had occurred as of 2009. For managed ponds this included habitat enhancement.

By: San Francisco Estuary Institute

Data: Wetland data from SFEI includes BAARI (v1, 2009) Baylands and Wetlands, NLCD 2006, and wetland tracker data.

Imagery: ESRI World Imagery (updated 2015)



FOR PARTICULAR WILDLIFE POPULATIONS

- ◆ Manage select ponds and areas to enhance snowy plover breeding success.
- ◆ Reintroduce rare and uncommon high-marsh plant species at sheltered shell ridges.
- ◆ Develop SBSPRP operation plans of managed ponds to maximize utility to waterbirds.
- ◆ Partner with current landowners of properties with current or potential benefits to wildlife and their habitat (e.g. Cargill, Bedwell Bayfront Park, Facebook). Partner with local municipalities to manage stormwater in Ravenswood ponds to benefit wildlife.
- ◆ Maintain and enhance pond management and predator management for snowy plovers and other waterbirds.
- ◆ Implement aggressive control measures for invasive plants including Algerian sea lavender, which could become a serious problem.
- ◆ Continue treatment of invasive *Spartina* at Bair Island and other sites, and continue revegetation plantings and other enhancements, such as high-tide-refuge islands.

Restoration Benefits

Implementing the recommendations would provide a large tidal salt marsh core area that would maintain and enhance the associated channel system. This would benefit harbor seals and several fish species. The tidal salt marsh restoration would directly benefit the salt marsh harvest mouse and the Ridgway's rail. Enhancing and restoring ponds would benefit shorebirds and waterfowl and would provide an opportunity to create or improve snowy plover nesting habitat.

Challenges

Challenges in this segment include PG&E transmission lines, substation, and other utility corridors; flood protection for urbanized areas and associated infrastructure (e.g., Highways 84 and 101); residential development adjacent to natural areas; the Port of Redwood City and adjacent development; other commercial industry; and the need for long-term predator management (including the political power to eliminate feral cat colonies). The depredation of snowy plover nests continues to be an issue where nesting habitat exists. Ongoing hazing and removal of predators is needed to reduce the nest-habitat displacement and depredation of snowy plovers. Invasive *Spartina* remains a critical priority, constraint, and consideration for some existing marshes and for restoration planning in this segment. Oyster drill populations could limit native oyster restoration. The SBSPRP is one of the key regional plans for this segment. Planning will require coordination with local agencies and organizations, including Caltrans, the US Fish and Wildlife Service, Menlo Park, Redwood City, the San Francisquito Creek Joint Powers Authority, PG&E, and Cargill.

levels and salinity (within the infrastructure limits). Levees surrounding the ponds would have to be built up to maintain these ponds for waterbirds as sea levels rise further. Snowy plover habitat in the Ravenswood pond complex would need active management to be maintained.

Bair and Greco Islands are generally of uniform elevation and will be threatened as sea levels rise. A levee will need to be built to protect Highway 101 along the western side of Inner Bair. A levee will also be needed next to the Ravenswood pond complex to prevent flooding Highway 84 and adjacent urban development.

LONG TERM (LATTER HALF OF THE CENTURY, AFTER SLR CURVE ACCELERATION)

In the longer term, if sea-level rise accelerates and sediment supply falls as projected, marsh plains will probably give way to narrower fringing marshes. Tidal marshes may be unable to keep up with the rising sea level, resulting in increased inundation of the marsh surface. This may lead to habitat conversion, perhaps to low marsh and mudflat. In addition, landward migration of the marsh is expected, and a gently sloping transition zone bayward of the levee would facilitate such a migration. If the area were to become available, restoring the Redwood City crystallizers could help provide large areas of restored tidal marsh, transition zone, and snowy plover habitat.

At some point in the future, the degree of sea-level rise may make it unrealistic to maintain the managed ponds to benefit waterbirds. Prior to that point, a plan for restoring or relocating the functions of these ponds should be implemented that would move them outside the hazard zone. Simply restoring tidal action to the managed ponds late in the century may result in the creation of tidal ponds. To alleviate this, “warping up” the ponds could be undertaken during the earlier part of the century, allowing the accretion of the pond to be managed as well.

Recommended Actions

FOR HABITATS AND THE LANDSCAPE IN GENERAL

- ◆ Restore large areas of tidal marsh with gradual bayside slopes, providing a continuous band along the bayfront for the entire length of the segment.
- ◆ Restore and enhance oyster beds and eelgrass beds at appropriate locations within this segment.
- ◆ Create transition zones on gentle slopes in front of flood-risk-management levees (or other high-ground areas).
- ◆ Protect lands adjacent to baylands to increase habitat and decrease flood risk to properties within the baylands. Work with willing landowners to protect undeveloped diked baylands as future tidal habitats and transition zone.
- ◆ Reduce the horizontal erosion of marshes by creating shell beaches in front of marsh scarps.

Outer Bair Island historically supported a variety of nesting terns (Caspian, Forster's and California least), as well as a large egret and heron rookery. The egret and heron rookery has returned, though its size has probably decreased. A large colony of cormorants can be found on the PG&E towers in Steinberger Slough. Western snowy plovers use levees and salt pan habitat in the Ravenswood pond complex year-round for nesting and overwintering. The SBSPRP has constructed islands for nesting at pond SF2 within this segment (and within segments S and P). These islands provide nesting habitat for snowy plovers, American avocets, black-necked stilts, and Forster's terns. The large isolated channels in the Corkscrew Slough area provide haul-out areas for harbor seals, and the bay's extensive tidal flats continue to provide excellent foraging habitat for shorebirds. Nearly all of the moist grassland areas have been urbanized.

Implications of Drivers of Change

Managed ponds in this segment will become increasingly difficult to maintain and operate at their current elevations. As sea levels rise, levees protecting the ponds will need to be maintained and raised, tide gates will have to be modified, and gravity-driven systems will have to be supplemented by pumping. Outboard levees in particular will be subject to greater wave action as water depths increase, allowing larger waves to propagate inshore. Increasing wave action will also accelerate erosion of marsh edges, resulting in a narrowing of marshes. Sedimentation rates on existing and inside restored tidal wetlands are expected to slow over time as suspended-sediment concentrations in the bay decrease.

Considerations for Implementing the Actions

NEAR TERM (NOW TO MIDCENTURY, PRIOR TO SLR CURVE ACCELERATION)

The near term offers significant opportunities to restore tidal marsh in managed ponds that will help create a continuous corridor of tidal marsh along the bayshore. The potential for land-use change at the Redwood City crystallizers should be monitored. The SBSPRP planning process has identified ponds R4, R1, and R2 as suitable for restoration in the near term. This restoration would include the reconnection of complex channel networks, incorporating topographic variation by placing material to mimic features such as natural levees, and could incorporate shallow pans. To accelerate the accretion of marsh surface in the subsided ponds, dredge sediment could be placed either directly within ponds or on adjacent mudflats to be taken by wave and tidal action into the ponds. Slopes to create elevation gradients and a transition zone between tidal marsh and lowland areas (as well as the upland habitats at Bedwell Bayfront Park) could be created adjacent to existing levees to provide buffer and high-tide refugia as well as habitat in its own right.

While rates of sea-level rise are low, some of the ponds could continue to be managed to provide habitat for shorebirds and waterfowl by changing their water

Unique Opportunities

Segment N has high potential for tidal marsh restoration and the enhancement of seasonal wetlands and ponds for shorebirds and waterfowl. This segment contains Bair Island, which is in the final stages of restoration. The Ravenswood pond complex offers an opportunity to maintain and enhance wetland habitat in close proximity to the large tidal flats that are critical for foraging shorebirds. Enhancing the salt pan could improve nesting habitat for the snowy plover. The Redwood City crystallizers and associated salt ponds are currently part of an operating business; however, they remain relatively undeveloped and are at elevations that make them attractive for potential future tidal habitat restoration. Bedwell Bayfront Park allows for some area of marsh migration as sea levels rise. Local sediment and water supplies could also be used for habitat creation.

Segment Features and Setting

Historically, this area was mostly tidal marsh with moist grassland habitat on the adjacent lands to the west. Large, well-developed channels and associated slough systems and numerous ponds characterized the tidal marshes in this segment. Outboard of the marshes were oyster shell beaches, large expanses of tidal flats, and oyster beds.

A natural deep-water channel at the mouth of Redwood Creek was developed into the Port of Redwood City. Due to regular deep dredging of this channel for the port, the Redwood Creek shipping channel acts as a sediment sink. Sloughs in this segment, including Steinberger, Corkscrew, and Smith, have silted in with the fill and diking off of most of the tidal marshes. A former landfill site, Bedwell Bayfront Park, is a small open space with a hilly grassland terrain that is found adjacent to the Ravenswood pond complex, Greco Island, and commercial property. Fringing tidal marsh exists in a narrow band along much of this segment.

Today, this area is highly developed, and many of the historical tidal marshes have been converted to salt ponds, managed ponds, and urban uses. Greco Island, the largest contiguous tidal marsh on the western side of the bay, is relatively protected from human disturbance; it is one of the main population centers of

Ridgway's rail in South Bay. Next to Greco Island, Middle and Outer Bair Islands have recently been restored to tidal action, and all are a focus of invasive *Spartina* treatment, native *Spartina* revegetation, and enhancement projects for rails. Inner Bair Island is also nearing restoration completion and will comprise both tidal marsh and transition zone habitats. The restoration of Bair Island, combined with tidal marsh restoration of portions of the Ravenswood pond complex as part of the South Bay Salt Pond Restoration Project (SBSPRP), would improve the continuity of tidal marsh habitat between Bair Island in the north of this segment, south to the Palo Alto baylands in segment O.

Northern pintail

