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# Blueprint for Resilient Coastal Communities in San Francisco Bay

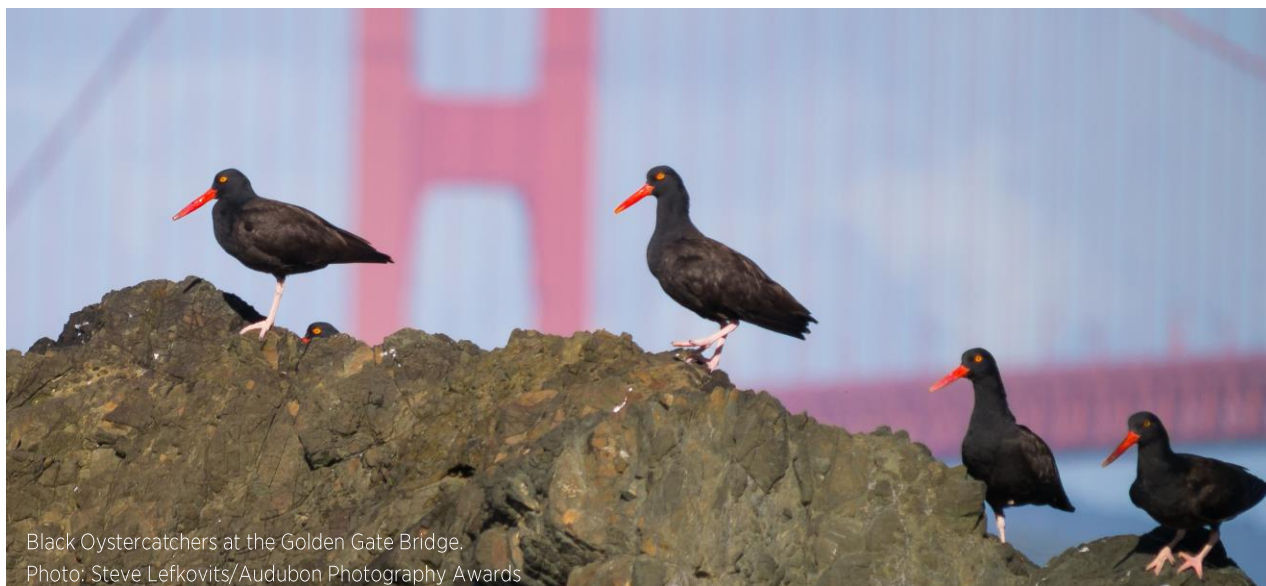
Creating a healthy climate future for birds and people



<https://ca.audubon.org/conservation/conservation/seas-shores/coastal-resiliency>



Great Blue Heron with gulls in Audubon's  
Richardson Bay Sanctuary in San Francisco Bay.  
Photo: Mike Fernandez/Audubon



Black Oystercatchers at the Golden Gate Bridge.  
Photo: Steve Lefkovits/Audubon Photography Awards

## Protecting Birds and People in a Rapidly Changing Climate

San Francisco Bay is the largest estuary on the Pacific Coast of North America. With its rich mudflats, marshes, and eelgrass beds, it is a vital link for migratory birds along the Pacific Flyway, which stretches from the Arctic to Central and South America. In addition to resident and breeding birds, tens of thousands of waterbirds such as grebes, pelicans, cormorants, and terns flock here to rest and feed during migration. Pacific herring, which spawn in the Bay's eelgrass beds, provide a vital food resource for these birds. However, waterbird species and the habitats on which they depend are in steep decline.

### Global Importance of San Francisco Bay for waterbirds

San Francisco Bay includes 10 Important Bird Areas, designated by the National Audubon Society, of which 3 are Globally Significant due to substantial populations of rare or endangered species. The Bay is also a designated site of Hemispheric Importance by the Western Hemispheric Shorebird Reserve Network, as well as a "Wetland of International Importance" under the Convention on Wetlands, known as the Ramsar Convention.

change and development. Without protecting, restoring, and improving the remaining natural resources of the San Francisco Bay to meet the needs of people and wildlife, the Pacific Flyway is at risk of collapse.

Several species of waterbirds, such as Surf Scoter and other diving ducks, are experiencing long-term population declines. These birds winter in the Bay in large numbers and breed in Canada's boreal forest. Shorebirds, such as the Western Sandpiper, that breed in the Arctic and forage on the Bay's rich mudflats during winter and migration are also seeing global declines. As human population pressures increase and climate change impacts accelerate, the factors threatening these birds will intensify.

### San Francisco Bay Program Priority Bird Species:

Greater Scaup  
Surf Scoter  
Western & Clark's Grebe  
Ridgway's Rail  
Black Oystercatcher  
Long-billed Curlew  
Western Sandpiper  
California Least Tern  
Elegant Tern  
Brown Pelican

### Habitats and Species in Decline

San Francisco Bay has lost 70-85% of its historic tidal wetlands due to human activity, and remaining habitats are increasingly threatened by climate

### Communities at Risk

The health of the Bay directly affects the region's economy and quality of life. Eight million people live, work, and recreate along its shores. The Bay serves as a transportation and commercial hub

(including the Port of Oakland, one of the largest industrial ports in the U.S.), supports commercial fisheries, and is home to other ever-expanding industries.



Volunteers remove marine debris and invasive plants from Aramburu Island in Audubon's Richardson Bay Sanctuary in San Francisco Bay. Photo: Audubon California

The intersection of urban development and natural systems creates increasing threats to wildlife. This includes habitat degradation, climate change, invasive species, human disturbance, pollution and unreliable food resources—many of which also affect vulnerable and marginalized communities.

Sea-level rise erodes habitat for birds and floods low-lying coastal communities. In the Bay area, these communities are often lower-income and have fewer resources with which to respond to flooding. Similarly, water quality issues impact bird health but also disproportionately affect communities already experiencing the impacts of climate change, industrial activity, and pollution.

## COASTAL COMMUNITIES NEED NATURE-BASED SOLUTIONS

Resilient, healthy coastal ecosystems benefit birds and serve as the first line of defense for coastal communities facing stronger storms, more frequent flooding, and sea-level rise. Audubon created this conservation strategy to advance nature-based solutions and partner with coastline communities to identify strategies to weather the impacts of climate change.

By restoring and protecting shoreline natural infrastructure like mudflats, marshes, and eelgrass beds, we can harness nature's own defenses. These coastal habitats can be more effective at buffering storm surge and protecting coastal communities

than gray infrastructure like jetties, groins, and seawalls. Natural infrastructure and other climate-smart solutions not only buffer storm impacts, reduce flooding, and minimize wetland loss, they also preserve biodiversity and support healthy populations of birds and fish.

## TARGETING OUR WORK FOR GREATEST CONSERVATION IMPACT

In 2020, Audubon's conservation, policy, and science teams conducted a spatial planning analysis to target our conservation work in the years ahead. Using mapping software, we overlaid the locations of priority bird habitat with areas of social vulnerability and high flood risk. The social vulnerability index included factors such as median income, population age, education levels, and more. We then added in information regarding sea-level rise impacts (i.e., where flooding is most likely to occur with 1.6 feet of sea-level rise over a 30-year period). This allowed us to prioritize potential restoration sites in and around vulnerable communities to protect birds and people where they are at highest risk from sea-level rise.

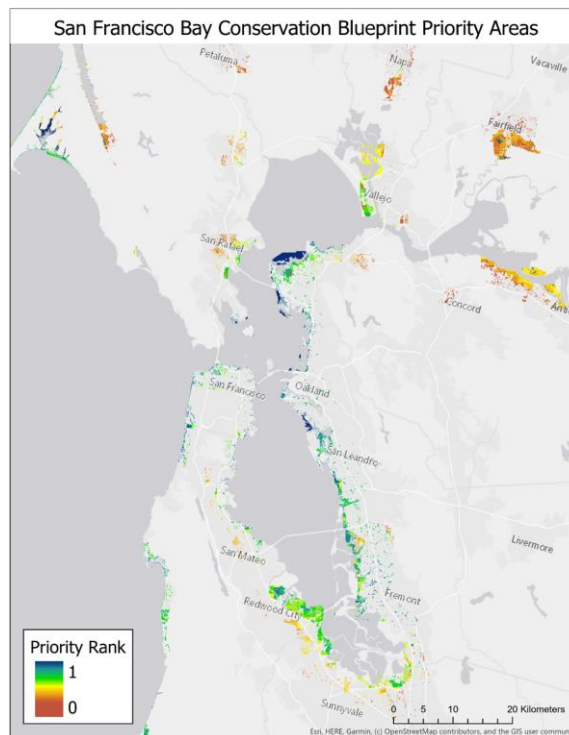


Figure 1: High priority areas for birds and people in San Francisco Bay, based on Audubon's 2020 spatial analysis of habitat value and social vulnerability.

The maps developed during this spatial analysis depict priority habitats (eelgrass, estuarine marsh, brackish marsh, unconsolidated shore, and transitional wetland/upland) and potential habitat (developed open space) within 2 kilometers of coastal communities with high flood risk. These regions were then ranked by their importance to one or more of our San Francisco Bay Program's priority birds. The rankings range from 0-1 with 0 (shown in brown) representing the lowest ecological value, and 1 (shown in blue) representing the highest.

Based on this analysis, Audubon identified more than 40,000 acres in the San Francisco Bay area where priority bird habitat and vulnerable communities were likely to be impacted by flooding (Figure 1). Within that, we identified three regions where communities are at the highest risk for impacts from flooding and where there is the greatest restoration potential with the most value to birds: these areas include the shorelines of Vallejo, Antioch, and Point Richmond (as depicted in the maps below and at right).

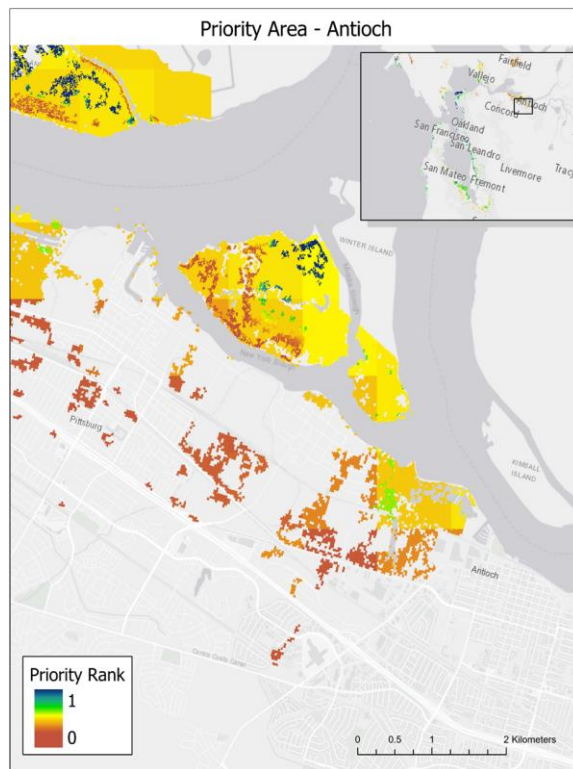


Figure 2b: Antioch, CA – a community in the San Francisco Bay Area identified as having an especially strong nexus between social vulnerability, risk from sea-level rise, and value to birds.

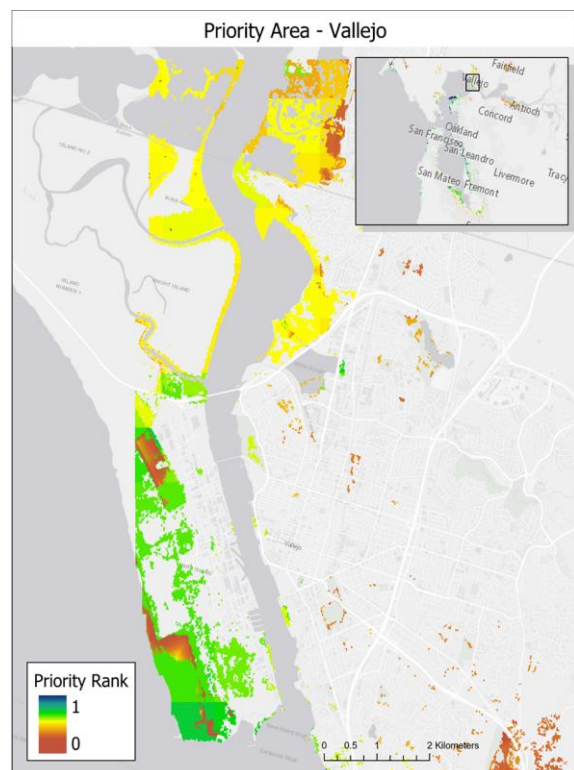


Figure 2a: Vallejo, CA – a community in the San Francisco Bay Area identified as having an especially strong nexus between social vulnerability, risk from sea-level rise, and value to birds.

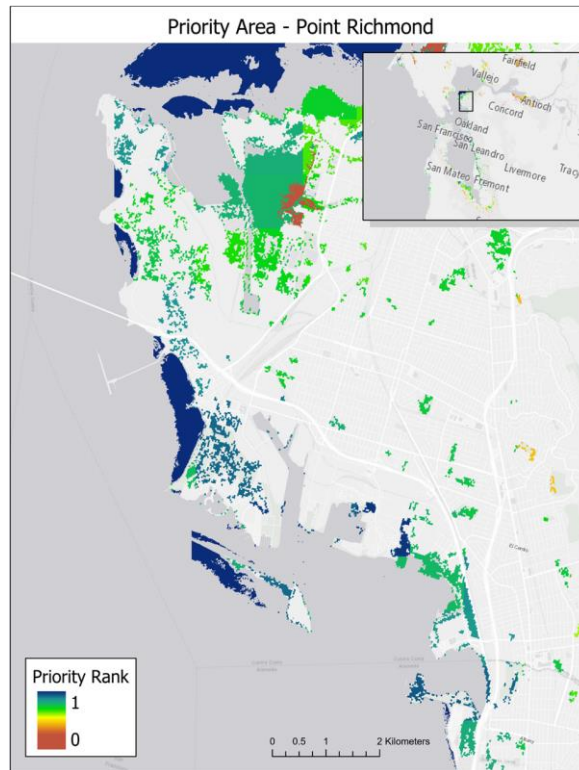


Figure 2c: Point Richmond, CA – a community in the San Francisco Bay Area identified as having an especially strong nexus between social vulnerability, risk from sea-level rise, and value to birds.



Surf Scoters rely on San Francisco Bay to rest and feed during their migration. Photo: Eric Reuter/Great Backyard Bird Count

## CONSERVATION and EQUITY IMPACT

### STRATEGY 1: RESTORE HABITAT AND IMPROVE CLIMATE RESILIENCE AT PRIORITY SITES THROUGHOUT SAN FRANCISCO BAY

Audubon's spatial analysis of priority bird habitat in San Francisco Bay, and where those habitats intersect with vulnerable human communities, has allowed us to target our conservation work to provide the most benefit in a changing climate. We will use the results of this analysis to focus our efforts on projects where Audubon's unique voice and skillset can create lasting, positive change for birds and people.

#### *Conservation and Equity Impacts:*

- Expand efforts to fund, plan, design, implement, and/or support innovative, climate-resilient habitat protection and restoration.
- Develop a revised habitat suitability model to guide protection and restoration of eelgrass habitat, incorporating climate change impacts.
- Drive \$500 million in new funding to San Francisco Bay restoration priorities and projects.
- Collaborate and partner with community-based organizations within vulnerable communities and help elevate their voices with funders, county and government offices, and conservation practitioners to restore habitat and alleviate impacts of coastal flooding.

### STRATEGY 2: ADVANCE POLICIES THAT KEEP THE SAN FRANCISCO BAY AREA HEALTHY AND RESILIENT FOR BIRDS AND PEOPLE

Audubon is the voice for birds from town halls to the U.S. Capitol. We will bring the full power of our expansive network to bear on behalf of the most important policies that will lead to protection for birds, ecosystem restoration and resilience, and healthy coastal habitats.



Audubon California staff and chapter leaders meet with California Assembly Member Rob Bonta's office during Audubon California's annual Advocacy Day. Photo: Audubon California

*Conservation and Equity Impacts:*

- Support a state “resilience bond” that prioritizes investments in natural infrastructure to address impacts of climate change.
- Inform priorities for planning and investing in natural infrastructure projects, including through Restoration Authority Measure AA and CA Coastal Conservancy grant programs, as well as through land-use plans, state adaptation plans, and infrastructure investments.
- Participate in California’s “Cutting the Green Tape” initiative to increase the pace and cost-effectiveness of restoration projects. Engage legislative champions to pass the federal San Francisco Bay Restoration Act and support appropriations for the Environmental Protection Agency’s San Francisco Bay Program.
- Advocate for increased protection of land in the Bay Area to protect California’s biodiversity and provide equal recreational access for all through California’s Executive Order 30 by 30 initiative.
- Support establishment and implementation of programs within federal departments (e.g., Department of Transportation, Federal Emergency Management Agency, and the U.S. Army Corps of Engineers) that support natural infrastructure projects, including beneficial use of dredge material.

**STRATEGY 3: ENGAGE AUDUBON COASTAL ADVOCATES IN RESTORATION, POLICY, AND ADVOCACY TO SUPPORT COASTAL RESILIENCE IN THE SAN FRANCISCO BAY AREA**

With support from Audubon members in California and eight Bay Area Audubon chapters, as well as staff and volunteers at our Richardson Bay Audubon Center and Sanctuary, Audubon is improving the health and resilience of San Francisco Bay’s shorelines for wildlife and communities.

*Conservation and Equity Impacts:*

- Partner with Audubon chapters and community-based organizations to engage 10,000 people on conservation and community-focused priorities through action alerts, letters, and meetings with elected officials.
- Support Audubon California’s annual Sacramento Advocacy Day to advocate for funding for restoration of San Francisco Bay and passage of bonds to address coastal resilience.
- Engage youth and provide job-training skills at local restoration projects that benefit wildlife and communities.



A Richardson Bay Audubon Youth Leader caring for a coast live oak sapling during her Audubon internship. Photo: Audubon California



Brown Pelicans, Double-crested Cormorants, and other waterbirds feeding at Audubon’s Richardson Bay sanctuary. Photo: Robert Hinz