

Draft: Renew San Francisco Bay Plan

SYNOPSIS

Measures to understand and respond to the challenges posed by the progressive impact of time, Nature, and evolution have become a crucial priority nationwide. Regionally, unless deliberate effort is taken, the San Francisco Bay shoreline is equally affected. To ease identification of shoreline to be restored, the 2011 *San Francisco Estuary Institute (SFEI) Operating Plan*¹ divided and numbered the areas into what is called *Operating Land Units (OLU)*², below. OLU 28, among other regions, is designated as a potential restoration site in the *San Francisco Subtidal Habitat Goals Project*³. OLU 28 comprises of the area known as *Yosemite-Visitation*, stretching from *Oyster Point*, south, to *Candlestick Park*, north, measuring approximately 408 acres. This shoreline is the area-of-interest to *Restore San Francisco Bay (RSFB)*, a citizen-action group intending to rehabilitate OLU 28 with the use of nature-based solution, namely, oyster reefs.



INTRODUCTION

Part of the *SFBSHGP* publication is a *50-Year Conservation Plan*³. The Project underscores the necessity to design, develop, and sustain the San Francisco shoreline as resilient to climate change, global warming, rising sea levels, coastal erosion, and other progressive threats of Nature. Equally important, the Project is a critical call-to-action to mitigate perilous effects of sea level rise. Responding to this call-to-action is *Renew San Francisco Bay (RSFB)*, founded in 2023 by Jordan Bow, of Royal Hawaiian Seafood, based in South San Francisco.

RSFB aims to restore and sustain the health of the subject region’s shoreline and ecosystem. In collaboration and partnership with federal, state, regional, and local efforts, *RSFB* envisions shoreline and ecosystem fortification as well as contributing to the *SF Bay Trail Project* toward a continuous interconnected public trail system along the region. Using science-based methodology and education, review of regional success and failures, funding through grants and fundraisers, collaboration and partnership, *RSFB* intends to execute efforts holistically and inclusively.

RATIONALE: Oysters and Oyster Reefs

Being filter feeders, oysters improve water clarity and quality. A single oyster can filter and process up to 50 gallons of water daily, effectively sequestering carbon within their shell structures. Oysters clean the water as they nourish themselves, extracting phytoplankton, organic matter, and removing excess nutrients from the water column. Specifically, removing nitrogen from the water helps to diminish harmful algae blooms. Oysters filter algae, sediment, and other pollutants to restore biodiversity. They can build reefs by attaching to hard substrates such as cement and residual oyster shells. Thus, oyster reefs provide habitat for crabs, fish, and other invertebrates for protection from predators, as well as offering nutrient cycling for macrofaunal communities⁴.

Oysters not only contribute to the integrity of water and sustain biodiversity, oysters have offered stunning variety and storied reputation for pearls and elegant cuisine from time immemorial. Yet, locally, what was once named *Oyster Point* in the South San Francisco/Brisbane regions because of the presence of oysters, *Oyster Point* is now devoid of its eponym as a direct result of landfill by humans coupled with effects of evolution, pollution, disease, over-harvesting, and habitat loss. Above all, oysters are a powerful unsung hero in the fight against climate change⁴.

HISTORY: Shoreline Restoration

Chesapeake Bay Foundation (CBF)⁵ in Maryland, with membership at 2,000 and a staff of three in the early 1970's, focused on Environmental Education and Resource Protection. More than 50 years later, CBF has successfully restored oyster habitats in multiple tributaries with approximately 1,740 acres of oyster reef. The *Chesapeake Bay Program* is leading the largest oyster restoration effort in the world.

In the *San Francisco Bay Area*, efforts to emulate the *Chesapeake Bay Foundation* have been made and perpetuated by NOAA, SFEI, the *State Coastal Conservancy*, the *Watershed Project*, the *Wild Oyster Project*, and the *Port of San Francisco*. Lessons learned and room-for-improvement experience now guide *Renew SF Bay*, specifically to follow the four-step process developed and applied by *Maryland's Chesapeake Bay Project*:

1. Choose a location
2. Create a restoration blueprint
3. Reef Construction and Seeding
4. Monitor and Evaluate

Renew SF Bay: Current Engagement

Since inception in 2023, *Renew SF Bay* has defined and explored relevant stakeholders to emerge as an informed entity engaging with people, plan, and purpose; mission and vision; and concern and contribution in the following manner:

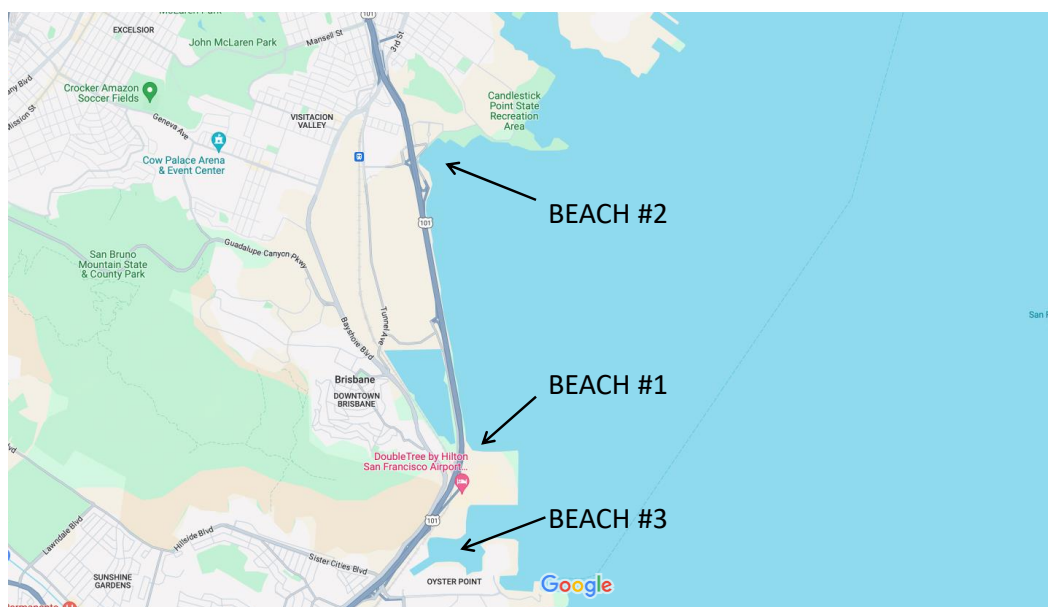
1. Attendance of relevant meetings of significant regional organizations in the SF Bay area participating in shoreline restoration, such as San Jose's *SPUR* and Burlingame's *One Shoreline*
2. Collaboration with relevant decision-makers at the city governance level, such as with the cities of Brisbane and South San Francisco; as well as with those in local academia to begin heightening awareness of students on the impact of climate change
3. Partnership with SF Bay organizations currently restoring shoreline such as the *U.S. Fish and Wildlife*, *NOAA*, *SFEI*, the *State Coastal Conservancy*, the *Watershed Project*, the *Wild Oyster Project*, and the *Port of San Francisco*
4. Fundraising with private business and community-based organizations such as *Royal Hawaiian Seafood*, *Harley-Davidson Owners Group (HOG)*, the *South San Francisco Rotary Club*, and *Scoma's Restaurant*⁶

Renew SF Bay: The Plan

Renew SF Bay plans to fulfill two objectives in shoreline restoration of OLU 28:

1. Establish self-sustaining oyster reefs
2. Capture sediment to create vertical shoreline growth

Location: Within OLU 28, Yosemite-Visitation, are three natural beaches identified by the SFEI Operating Plan in as appropriate for oyster restoration in the intertidal zones. The shoreline ecosystems in these locations have been severely impacted by decades of landfill and neglect. In all three beaches identified, RSFB intends to establish self-sustaining oyster reefs and to capture sediment to create vertical shoreline growth. RSFB intends to emulate *Chesapeake Bay's* historical efforts as well as reference SFEI's 2019 *SF Bay Shoreline Adaptation Atlas*⁷ for further and updated guidance locally.



Beach #1: Owned by the city of Brisbane, *Sierra Point Shell Beach* is located on the northern end of Sierra Point and across from the Lagoon on the west side of Highway 101. There is a freshwater stream that comes down from the San Bruno mountains which may lower salinity after rainfall. Riprap rocks border the beach at both ends.



Beach #2: *Candlestick Park Beach* is on the north end of a small bay, adjacent to Candlestick Park, approximately four to six times the size of *Sierra Point Shell Beach*. Initial shoreline restoration will be proximal to the highway within the city limits of Brisbane. Riprap rocks border *Candlestick Park Beach* at both ends.



Beach #3: Oyster Cove Beach is in South San Francisco’s Oyster Cove, adjacent to the currently inoperable Oyster Cove Marina. It can be classified as a tidal marsh ecosystem. Owners of Oyster Cove Beach plan to add electric air taxi pads that jut out of the water adjacent to the shoreline intended to be restored.

Restoration Blueprint: Understanding that a significant feature of success is effective management of unanticipated outcomes, RSFB proposes five options in shoreline restoration of the above-proposed Beaches. These options have been selected, in part, to learn firsthand of the type of sea bottom each area has in the event they differ. Granted, sonar is customarily used to determine the integrity of the sea bottom, but is currently not affordable. Details of each option are available in the the 2024 *RSFB Restoration Blueprint*⁸.

1. **Oyster mounds:** Desired outcome is a self-sustaining stable oyster reef mound established upon degradation of the mesh bags containing the oyster shells.
2. **Oyster ridges:** Desired outcome is the build-up of residual, heavier sediment and loose shells as the tide flows out, allowing a stable base structure self-created by the developing oyster reef.
3. **Reef paste on wood logs or structures:** Desired outcome is creation of a substrate base for oyster spat settlement, a relatively simpler and lower-cost option.

Reef Construction and Seeding: In the event of already-existing reef, yet absence of any living oysters or evidence thereof, the following two options will be explored. Details of each option are available in the detailed *Restoration Blueprint*⁸.

1. **Suspension Truss:** Desired outcome is augmentation of already-existing row of mesh oyster shells bags by vertically hanging strings or tubes of oyster shells into the water.
2. **Cultching:** Desired outcome is augmentation of already-existing oyster reef by spraying loose shells onto the oyster bag strands, mounds, or structures.

Monitoring and Evaluation: Upon assessment of complete seeding, reefs will be monitored at the three-year and six-year marks to ensure fulfillment of standards and criteria for a “restored reef.” Details are available in the *RSFB Restoration Blueprint*⁸.

References

1. 1993 <https://www.sfei.org/contact>
2. 2018 <https://sfbaycharg.org/wp-content/uploads/2018/12/SFEI-OLU-Summary.pdf>
3. 2011 https://www.sfbayrestore.org/sites/default/files/2019-08/subtidal_goals-exec_summary_20pp.pdf
4. <https://www.worldwildlife.org/stories/oysters-an-unsung-hero-in-a-changing-climate>
5. <https://www.cbf.org/about-cbf/history/>
6. 2024 RSFB/WOP Save-Your-Shucks Program
7. 2019 <https://www.sfei.org/adaptationatlas>
8. 2024 RSFB Restoration Blueprint⁷