



GREATER FARALLONES & CORDELL BANK NATIONAL MARINE SANCTUARIES

Greater Farallones National Marine Sanctuary

Condition Report Quick Look

2010–2022



Photo: Douglas Croft

GREATER FARALLONES NATIONAL MARINE SANCTUARY



Photo: Matt McIntosh/NOAA

Greater Farallones National Marine Sanctuary was designated in 1981 and expanded to its current size of 3,295 square miles in 2015. The sanctuary is located off the California coast, extending west of southern Mendocino, Sonoma, Marin, San Francisco, and San Mateo counties. The sanctuary extends from the mean high tide line, with exceptions, to the continental margin at or about the 10,000-foot depth contour, and includes Estero Americano, Estero de San Antonio, Tomales Bay, and Bolinas Lagoon, as well as the waters surrounding the Farallon Islands. It is adjacent to Cordell Bank and Monterey Bay national marine sanctuaries.

Condition reports provide a standardized summary of resources in NOAA's national marine sanctuaries, driving forces and pressures on those resources, current conditions and trends for resources and ecosystem services, and existing management responses to pressures that threaten the integrity of the marine environment. The reports are produced in collaboration with subject matter experts who have knowledge of each sanctuary. This report uses the best available information to assess the status and trends of sanctuary resources and ecosystem services from 2010 to 2022. It includes information on water quality, habitat, living resources, maritime heritage resources, human activities, and ecosystem services.

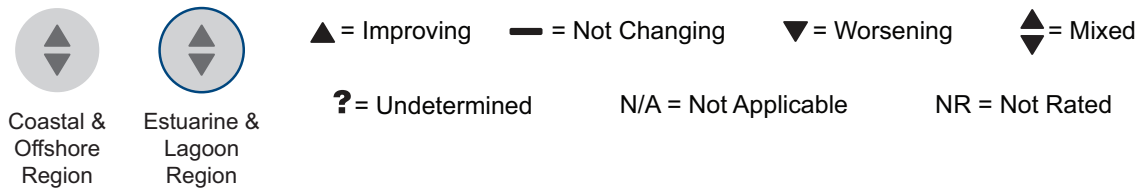
Condition reports help sanctuaries determine whether management goals are being achieved. This report will provide information for the management plan review process that will begin in late 2024 to set priorities for the sanctuary over the next 5–10 years. The report may also be used by those who want to learn about the sanctuary and its management.



GREATER FARALLONES NATIONAL MARINE SANCTUARY

Condition Report Quick Look

Note: Resource questions were assessed separately for the sanctuary's coastal and offshore and estuarine and lagoon regions (see legend).

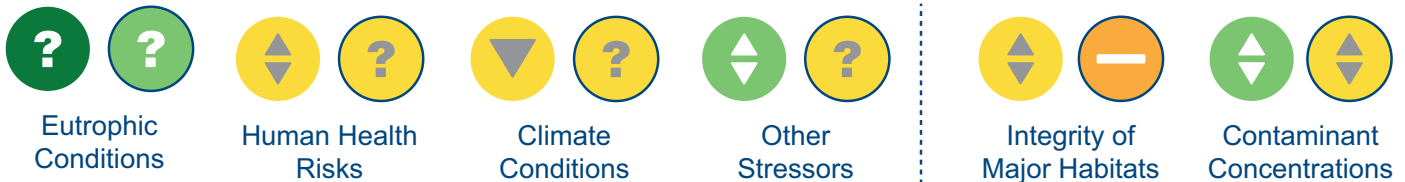


Drivers/Pressures



Water Quality

Habitat



Living Resources

Maritime Heritage



Ecosystem Services



CONDITION OF SANCTUARY RESOURCES

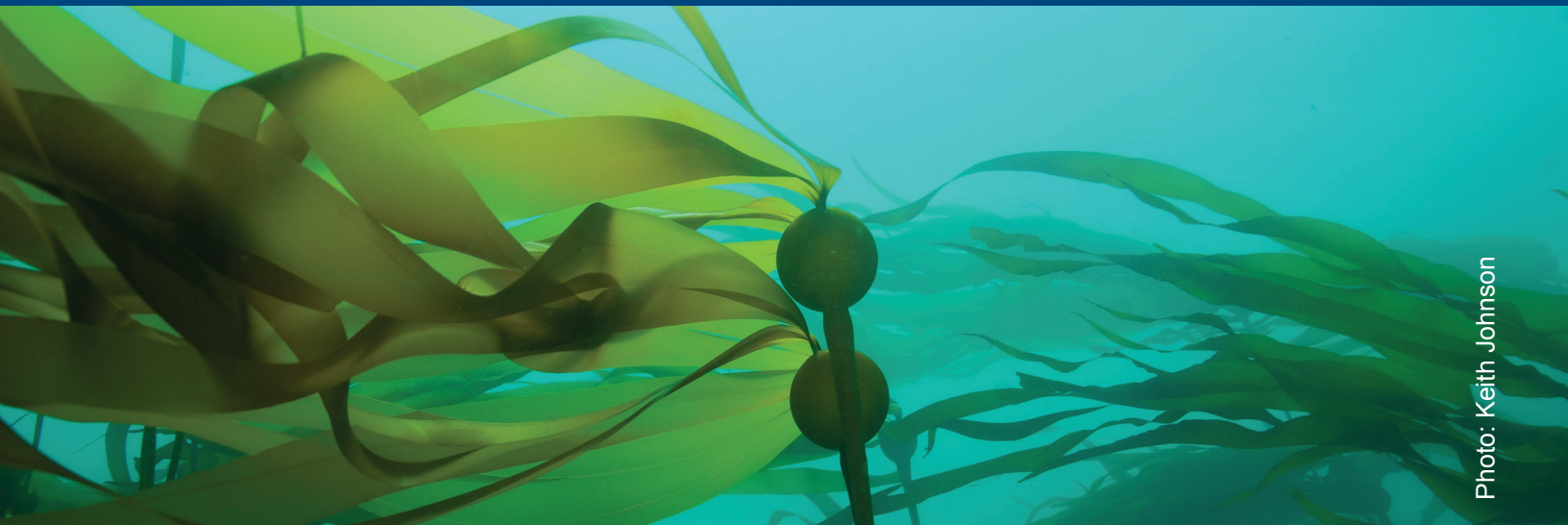


Photo: Keith Johnson

The condition of the sanctuary ranged from fair/poor to good. The primary pressures identified were climate change, land use, marine harvest activities, vessel activity, marine debris, wildlife disturbance, and non-indigenous species. Climate-related pressures of greatest concern are rising ocean temperatures, marine heatwaves, habitat compression, and ocean acidification, as well as sea level rise and changes in storm frequency and intensity, which can cause changes to shorelines and sediment transport.

Water Quality

Climate stressors impacted water quality throughout the sanctuary. Offshore, marine heatwaves in 2014–2016 and 2019 were linked to harmful algal blooms and habitat compression. Instances of unusually high sea surface temperature were observed during the study period, and ocean acidification was evident deeper offshore. In the estuarine and lagoon environment, increased sea surface temperatures, declines in precipitation, and associated increases in salinity occurred. Water quality issues also posed a risk to human health in coastal and offshore as well as estuarine and lagoon environments.

Habitat

Kelp habitat decreased by over 90% since 2014 and has not recovered, while percent cover of key habitat-forming species in rocky intertidal habitat was stable. Levels of shoreline armoring remained low, but most beaches experienced erosion, which threatens ecosystems. No recent marsh and mudflat habitat losses occurred, although this habitat was already reduced from historic levels.

Vessel impacts include damage to seafloor habitat from anchoring and grounded or sunken vessels; discharge of oil, sewage, and debris in the water; air and water pollution via exhaust gas emissions; and noise pollution. Marine debris was observed in all sanctuary habitats, entangling wildlife and damaging sensitive species. Lost fishing gear was the most common type of debris observed on the seafloor.



Photo: U.S. Coast Guard

Living Resources

Overall, biodiversity in the sanctuary was within the expected range of long-term natural variability, although more information is needed on biodiversity in the estuarine and lagoon environment. Shifts in species distribution resulting from the 2014–2016 marine heatwave may have affected the biodiversity of the sanctuary in both positive and negative ways.

In the coastal and offshore environment, sea stars were decimated by sea star wasting disease. This resulted in an increase in their prey, purple urchins,

which extensively fed on kelp and contributed to bull kelp loss and lack of recovery.

Densities of humpback whales increased in the sanctuary during the study period, but they still face several concerning threats, including ship strikes, entanglements, and climate-related changes in forage species and habitat compression.

Seabird abundances at the South Farallon Islands remained stable or increased over the past two decades, while shorebird presence along the mainland remained stable or decreased. Rocky intertidal species showed variability over time, but overall species abundances or percent cover remained stable or increased once the 2014–2016 marine heatwave subsided, with the exception of northern rockweed, which decreased.

Maritime Heritage Resources

Shipwrecks and doghole ports are the primary documented tangible maritime heritage resources in the sanctuary's coastal and offshore environment. Although these sites are not monitored, human impacts to resources were thought to be minimal, with natural degradation as the primary threat.



Photo: Steve Lonhart/NOAA

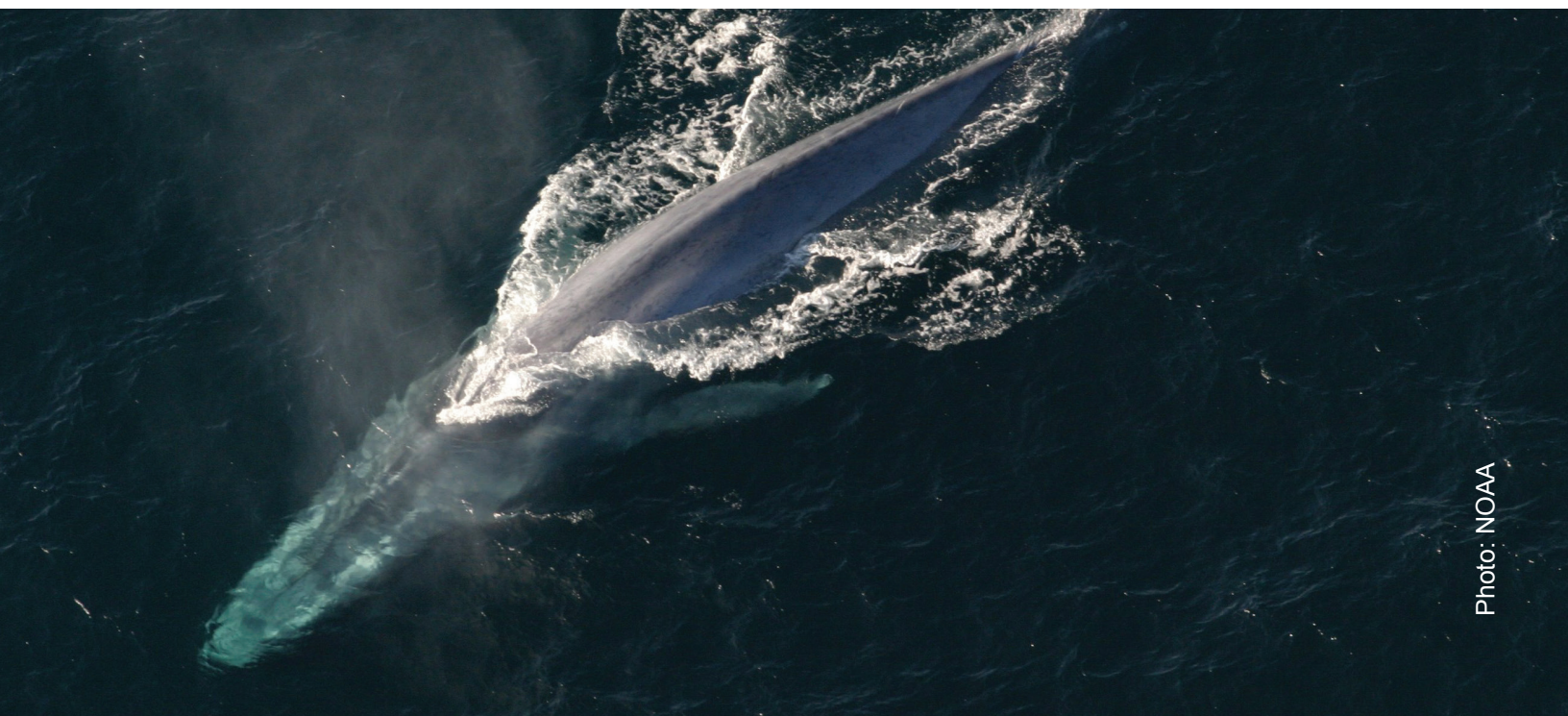


Photo: NOAA

CONDITION OF SANCTUARY ECOSYSTEM SERVICES

Ecosystem services are the benefits that humans receive from natural and cultural resources. Seven types were considered in this report: commercial harvest, consumptive and non-consumptive recreation, science, education, heritage, and sense of place.

Commercial Harvest and Consumptive Recreation

Fisheries in the region are considered abundant and diverse, with species such as Dungeness crab, salmon, and groundfish commonly targeted in both commercial and recreational fisheries. Recent changes in ocean temperature and extensive harmful algal blooms contributed to crab fishery opening delays and closures. These measures were designed to reduce the risk of fishing gear entanglement with whales during marine heatwaves, as well as risks to human health associated with harmful algal blooms. Temperature changes also contributed to the loss of kelp, resulting in the collapse of the red abalone sport fishery.

Science

Since the last condition report, Greater Farallones National Marine Sanctuary has responded to pressures by developing more robust, new, and extensive monitoring projects to better understand impacts and measure management effectiveness. However, some challenges remain, including insufficient staffing and funding levels and difficulties in accessing certain areas of the sanctuary for science activities.

Education

Greater Farallones National Marine Sanctuary has a variety of educational offerings to reach students and teachers in formal classroom settings, as well as informal outreach to general audiences. These education projects aim to ensure that the current and next generation of ocean stewards are aware of the sanctuary, understand its importance to the environment and a healthy Bay Area community. The demand for sanctuary school education programs exceeded the capacity of staff, facilities, and funding, limiting the ability to reach new audiences and engage the diverse communities of the San Francisco Bay Area.



Photo: Sophie Webb/NOAA and Point Blue Conservation Science

Heritage

Thousands of years of maritime and coastal history contribute to the rich heritage of the sanctuary region. The sanctuary supports heritage ecosystem service through protection of historic shipwrecks and places, interpretation through exhibits and programs, and partnerships with regional museums and organizations. As a result of sanctuary expansion and increased recognition of the important maritime heritage resources in the expanded boundaries, the ability to support this service has improved, but more information, collaboration, and partnership is needed. There is a need to identify and characterize iconic heritage locations and locate and assess shipwrecks so that sanctuary management can better protect these special places.



Sense of Place and Non-Consumptive Recreation

The sanctuary's long shoreline and proximity to a major metropolitan area provides access points to connect with many communities in north-central California. Greater Farallones National Marine Sanctuary cultivates this community connection and sense of place through media (film, video, and photography), field trips, and volunteer opportunities.

Sanctuary habitats provide opportunities for non-consumptive recreation, including wildlife viewing, board sports, kayaking, diving, beachgoing, and tidepooling. The productive ocean ecosystem has supported wildlife viewing businesses, with some increase in demand observed. Engagement in recreational activities like surfing, stand-up paddle boarding, and wildlife watching from shore and from vessels appear to have increased in the sanctuary.

WHAT WE LEARNED

- From 2010–2022, Greater Farallones National Marine Sanctuary has focused on reducing human-caused pressures that have threatened sanctuary resources.
- Climate-change-related impacts, such as extreme storm events, rising sea levels, marine heatwaves, ocean acidification, and increased erosion, negatively impact livelihoods dependent on a healthy ocean environment, including commercial fishing, recreational operations, and tourism economies.
- Addressing identified issues, threats, and challenges to sanctuary resources and communities will require participation by, and coordination with, a variety of agencies and organizations.
- The sanctuary is fortunate to work with partners that contribute to managing human activities, addressing marine conservation issues, and protecting invaluable natural and cultural treasures.

What Can You Do to Help Greater Farallones National Marine Sanctuary?

Participate in the Management Plan Process

- Learn about the management plan review process and submit comments during public comment periods.
- Contact a Sanctuary Advisory Council member to share your input.

Follow on Social Media

- Follow NOAA's Greater Farallones and Cordell Bank National Marine Sanctuaries on Facebook and @GFCBSanctuaries on Twitter.

Learn How We Address Climate Change

- Learn from NOAA's top climate scientists how to mitigate ocean warming.

Learn Before You Go

- Contact your local California Department Fish and Wildlife office about local fishing regulations and refer to resources for fishing provided by NOAA Fisheries.

Visit a Sanctuary Exhibit

- Share the wonders of the sanctuary with friends and family at several museums and visitor centers in the region.