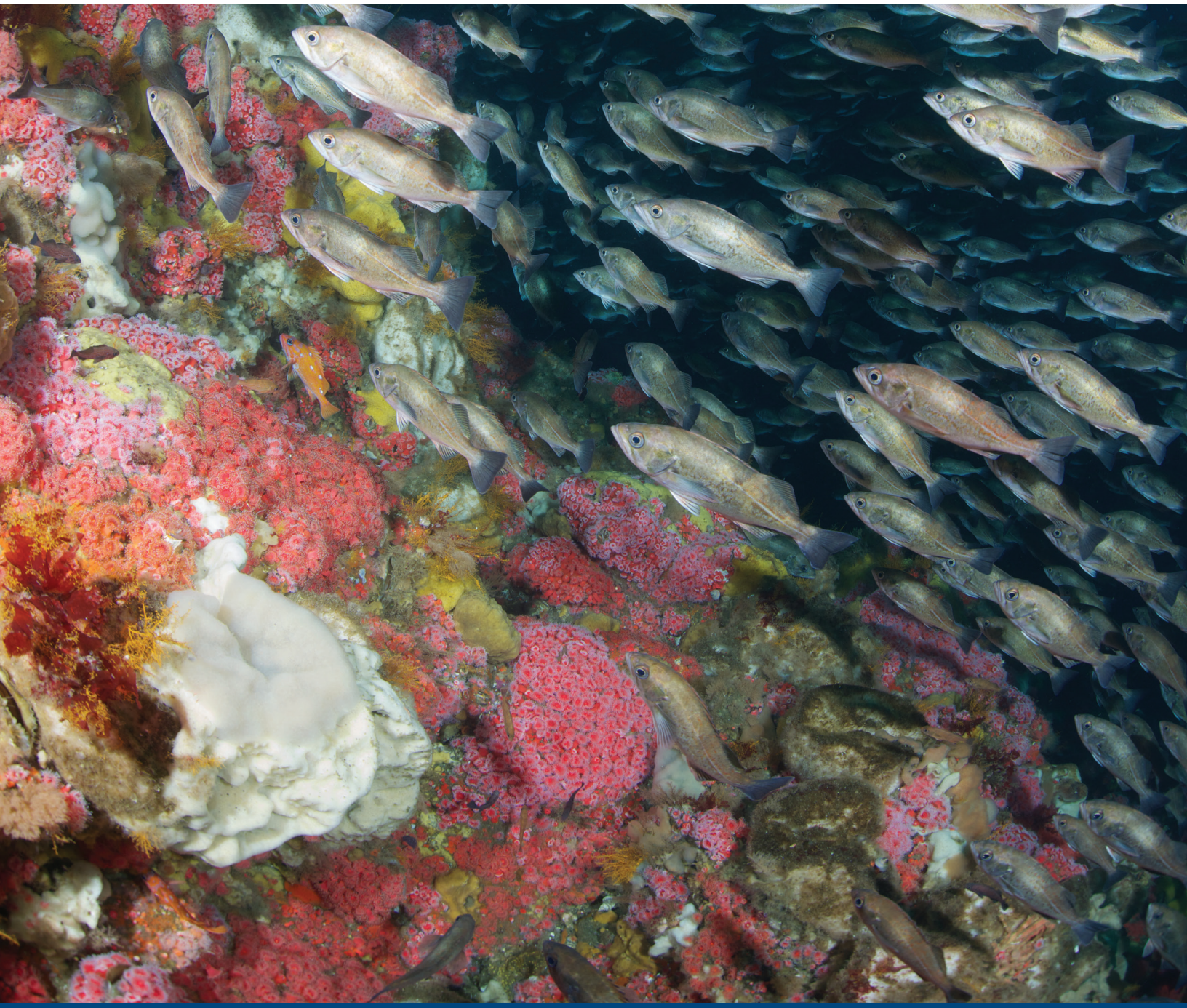
Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

GREATER FARALLONES & CORDELL BANK NATIONAL MARINE SANCTUARIES

Cordell Bank National Marine Sanctuary

Condition Report Quick Look

2009–2021



https://cordellbank.noaa.gov

CORDELL BANK NATIONAL MARINE SANCTUARY

CONDITION REPORT QUICK LOOK


Photo: C. Bauder/BAUE

About Cordell Bank National Marine Sanctuary

At 1,286 square miles, Cordell Bank National Marine Sanctuary is entirely offshore, with its southern boundary located 42 miles north of San Francisco, eastern boundary located six miles from shore, and western boundary located 30 miles from shore. Seafloor features, such as the rocky Cordell Bank, deep Bodega Canyon, steep slope, and continental shelf habitats, combined with significant upwelling ocean conditions, create an extremely productive marine environment in the sanctuary, with an array of species that contribute to its unique biodiversity.

What are Condition Reports?

Condition reports are used by NOAA to assess the condition and trends of national marine sanctuary resources and ecosystem services. These reports provide a standardized summary of resources in NOAA's national marine sanctuaries, driving forces and pressures on those resources, and current conditions and trends for resources and ecosystem services. These reports also describe existing management responses to pressures that threaten the integrity of the marine environment.

How are Condition Reports Drafted?

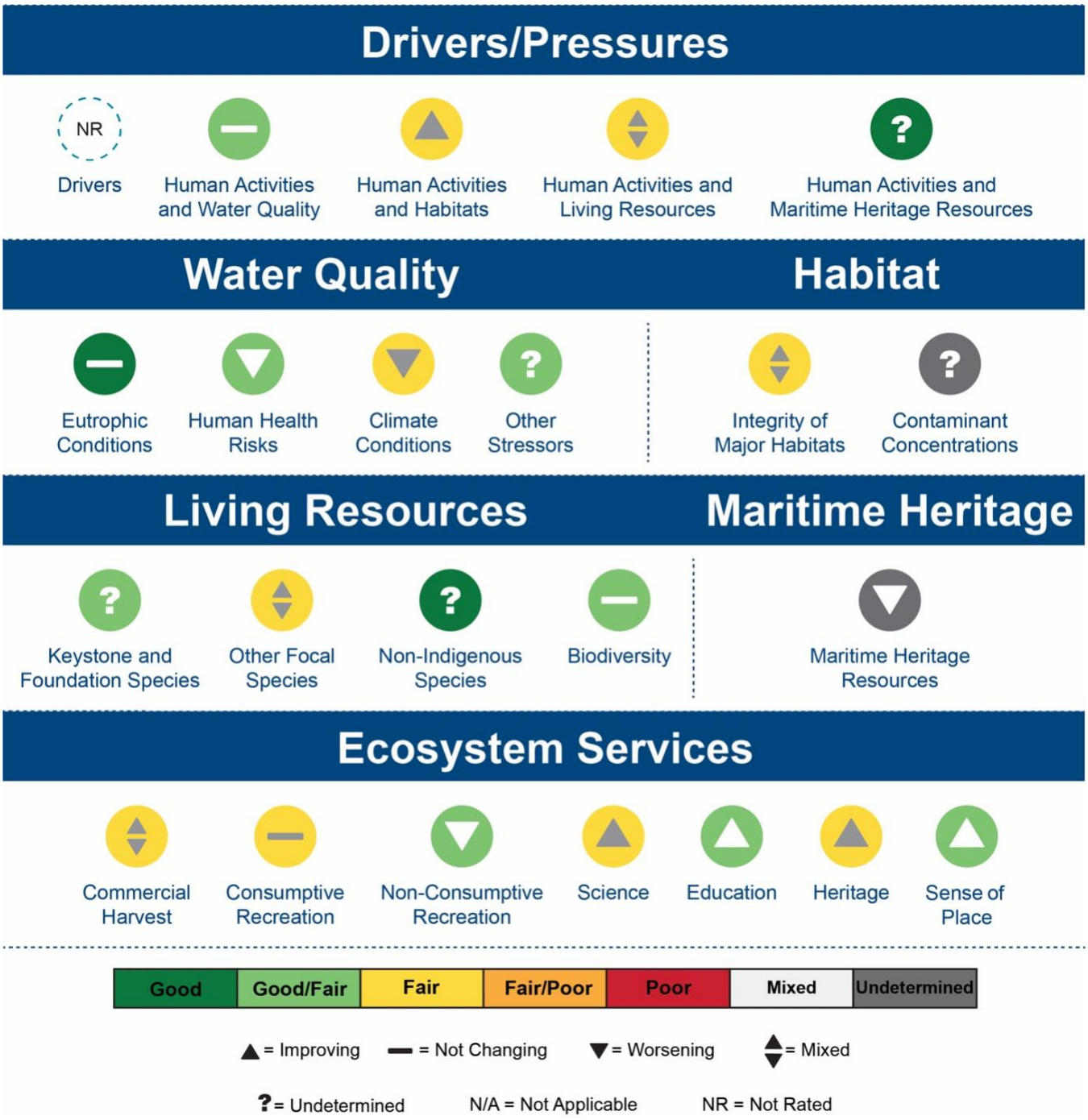
The condition report was drafted in collaboration with many subject matter experts with knowledge of Cordell Bank National Marine Sanctuary. This report updates and enhances the 2009 report, and includes information on the status and trends of water quality, habitat, living resources, and maritime heritage resources, and the human activities that affect them. It also includes an assessment of ecosystem services provided by the sanctuary.

How will this Condition Report be Used?

Condition reports help sanctuaries determine whether management goals are being achieved. This report will provide information for the management plan review process that begins in 2024. The report may also be used by those wanting to learn about the sanctuary and sanctuary management.

CORDELL BANK NATIONAL MARINE SANCTUARY
CONDITION REPORT QUICK LOOK

Condition reports use the best available science and information to assess the status and trends of critical components of the sanctuary's ecosystem, the pressures affecting them, and changes in the benefits and services they provide to society. The reports guide sanctuary management and inform issues that may need to be addressed during the sanctuary's management plan review.



What are the Conditions and Trends of Sanctuary Resources?

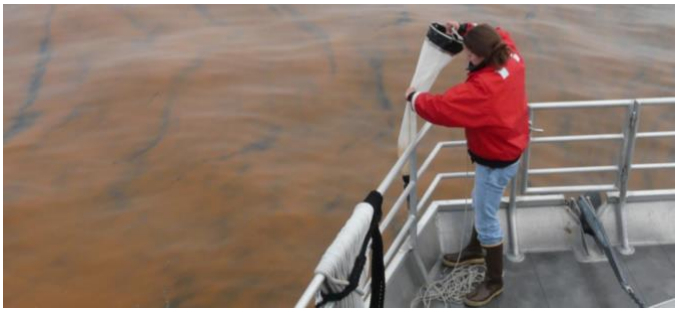

Photo: C. Bauder/BAUE

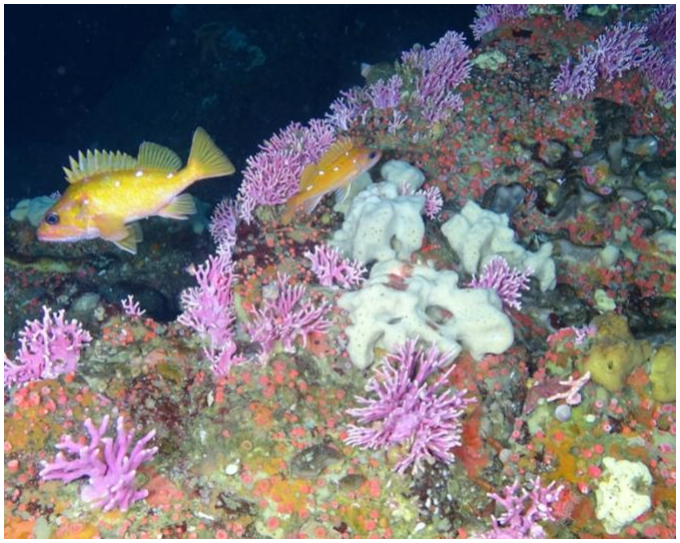
How are Sanctuary Resources Doing at Cordell Bank National Marine Sanctuary?

The sanctuary's habitats were found to be in good condition overall, with good water quality throughout the assessment period. Biodiversity appeared to be good and relatively stable. The primary pressures identified for the sanctuary include effects related to climate change, such as marine heatwaves and ocean acidification, as well as other human-related impacts like fishing, vessel activity, and marine debris. These are likely to have a significant influence on the status and trends of sanctuary resources in the future, and it is important that the sanctuary works with partners moving forward.

Water Quality

Climate change has affected water quality in the sanctuary. The marine heatwave from 2014–2016 resulted in unprecedented extreme conditions. In addition, during the last 10 years, the sanctuary experienced high variability between cold and warm conditions. The localized upwelling that occurs appeared to offer some buffering and protection from extreme temperatures in the region. There are indications that harmful algal bloom frequency and duration may be worsening over time. The 2014–2016 marine heatwave caused habitat compression, which forces suitable habitat for forage species and their predators to be concentrated closer to shore instead of distributed over the continental shelf and shelf break. These climate impacts have had repercussions to habitat, living resources, and ecosystem services.


Algal blooms affect the food web in the offshore environment and can result from warm ocean conditions. Photo: D. Devlin/Point Blue and NOAA


Cordell Bank is a valuable habitat for many species of rockfish. Photo: NOAA

Habitat

Sanctuary habitats were found to be relatively undisturbed and in good condition overall. However, climate change impacted the pelagic habitat through marine heatwaves, habitat compression, and ocean acidification. In addition, noise from ships has affected habitat quality, which can in turn affect animal behavior and health; however, more information is needed about the multi-year trend of this metric.

What are the Conditions and Trends of Sanctuary Resources?

Living Marine Resources

Living resources in the sanctuary are diverse, and were given a range of status and trend ratings. Abundances of some foundation species (copepods, krill, corals, and sponges) were stable, while others were variable. Krill and copepods fluctuated during the study period in response to variations in ocean conditions. Krill density and size decreased during the 2014–2016 marine heatwave, and boreal copepods declined during the study period. Variations in copepods and krill can affect predator species. During the 2014–2016 marine heatwave, the total number of different species of copepods in the ecosystem shifted to a higher abundance of less nutritious species. Whales, fish, and seabirds are predators of krill and copepods, and changes in these forage species affect their distribution, health, and breeding success.

Corals and sponges on Cordell Bank appeared to have stable densities in both the shallow and deeper depth strata of the bank, based on available data and observations. In addition, the majority of corals were healthy. Some sites on Cordell Bank are monitored, but the time series is not yet long enough to determine trends, and the number of monitored sites is small.

Albatrosses feed in the waters of the sanctuary. Photo: S. Webb/NOAA

Whale populations on the West Coast are recovering from historic harvest, but these populations remain vulnerable. The status of blue, fin, and humpback whales is a concern because they face several threats in and around the sanctuary, including ship strikes, entanglements, and climate-related changes in forage species and habitat compression.

Rockfish populations have improved since the last condition report, at least in part as a result of changes in management implemented by the Pacific Fishery Management Council. However, although rockfish are at management targets, they remain far below pristine levels.

Biodiversity in the sanctuary appeared to be good and relatively stable based on groundfish, benthic invertebrates, and seabird communities. This was an improvement from the previous condition report based largely on the recovery of rockfish populations along the West Coast. Deep-sea expeditions from 2017–2019 expanded the list of known species within the sanctuary, and further study is likely to increase knowledge of deep-sea biodiversity.

Bamboo corals are a long-lived deep-sea coral species. Photo: OET/NOAA

Photo: S. Webb/NOAA and Point Blue

How do People Benefit from the Sanctuary?

What are Ecosystem Services?

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

Consumptive Recreation

Consumptive harvest and consumptive recreation are ecosystem services to which the sanctuary contributes, and are part of its heritage. Dungeness crab, salmon, and groundfish are commonly targeted. Recent changes in ocean temperature and extensive harmful algal blooms have impacted fisheries. Fishery delays and closures have been implemented to mitigate harmful algal bloom exposure and entanglement risk. This has compromised the extent of consumptive recreation in the sanctuary.

Commercial and recreational fishing are activities whose success rely on the health of the ocean conditions in the sanctuary. Photo: S. Webb/NOAA

Science

Cordell Bank National Marine Sanctuary has a strong science program, but the ecosystem service of science has been limited by the difficulty of accessing the sanctuary. Compared to other sanctuaries with a shoreline, accessing the sanctuary to conduct research presents challenges such as remoteness, rough weather, limited number of research vessels and research institutions nearby, and a small science staff. The trend of this service was determined to be improving based on the sanctuary expansion, which spurred new research interest and expanded the area for research.

Education

Through targeted education, sanctuary staff have expanded awareness about the sanctuary among students and teachers, as well as within the larger Sonoma and Marin community. Staff have also worked with students and teachers through professional development training on specific ocean topics.

Students analyze a photo of an albatross bolus to learn about the impacts of plastic pollution on this far ranging seabird. Photo: A. Ninokawa/NOAA

How do People Benefit from the Sanctuary?

Heritage

The heritage of the sanctuary includes commercial and recreational fishing, science and exploration, and the presence of maritime heritage resources (archaeological, cultural, historical properties). There is one suspected shipwreck within the sanctuary, and there is limited information on other cultural resources. The Navy destroyer, the USS *Stewart*, has not been specifically located or assessed since it was intentionally sunk in 1946 within what is now the sanctuary, but it likely continues to retain cultural and historical significance and educational value. At this time, the sanctuary is unaware of other maritime heritage resources or information that suggests historical connections of Indigenous peoples to Cordell Bank specifically.

The USS *Stewart* is a suspected shipwreck intentionally sunk in the waters that later became part of Cordell Bank National Marine Sanctuary. Photo: Robert Schwemmer Maritime Library

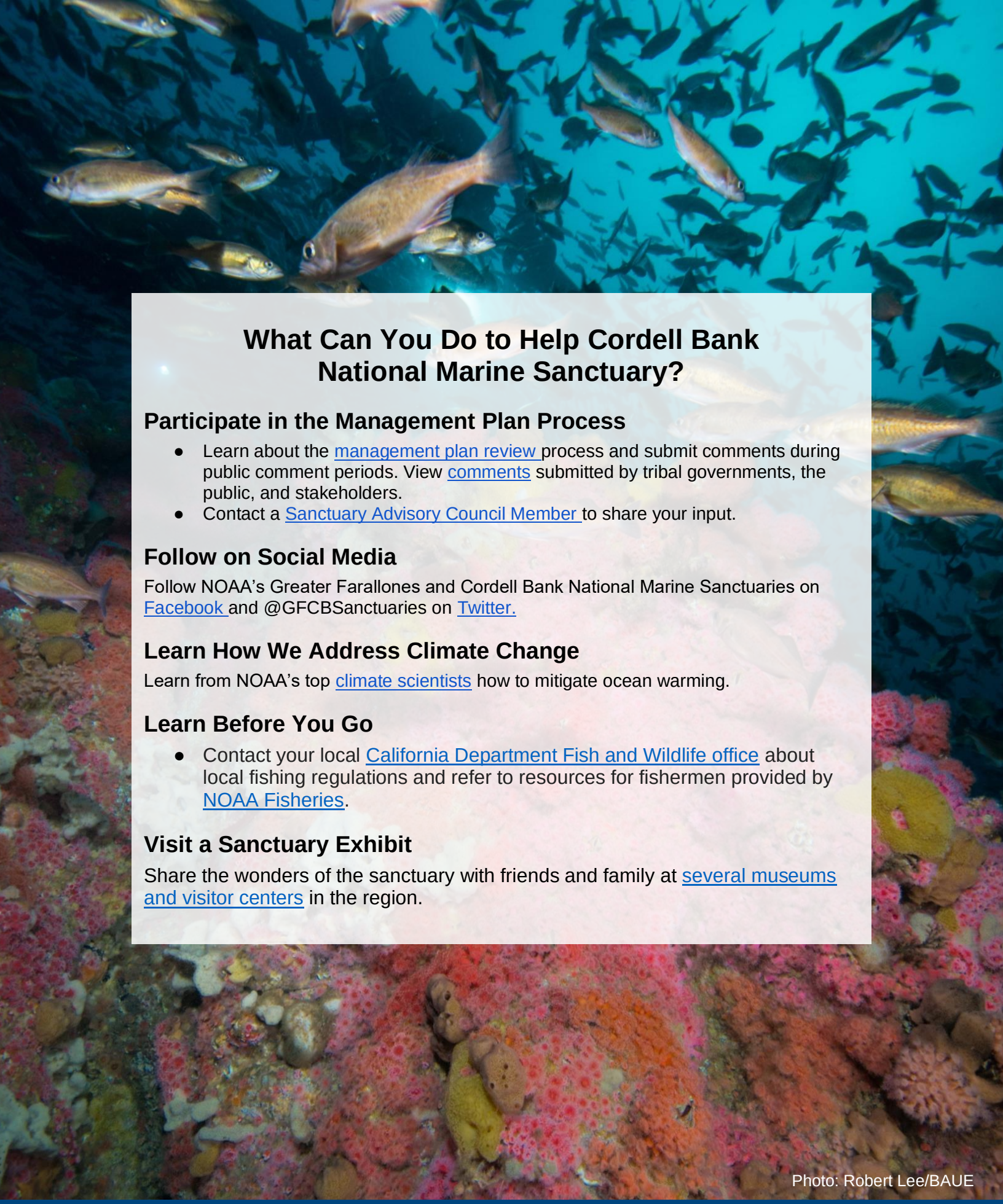
Sense of Place

Cordell Bank National Marine Sanctuary is a challenging place to visit. A limited number of businesses provide trips to the sanctuary; therefore, very few people are able to access it. Demand to visit the sanctuary is supported by the abundance and variety of wildlife that the sanctuary supports, such as baleen whales and pelagic seabirds. Many of those who have experienced the sanctuary have developed strong, lasting connections. Staff and partners have worked to bring the sanctuary to people through media such as telepresence and photo exhibits. Improved imagery, exhibits, and technology have increased the quality of connections to the public.

Wildlife watchers on a sanctuary sponsored wildlife watching trip experience the offshore environment and observe diverse wildlife. Photo: NOAA

What Did We Learn from this Condition Report?

- Including ecosystem services for the first time for this report allowed us to evaluate the benefits the sanctuary provides to humans.
- Critical issues and human activities occurring within and beyond the sanctuary such as ship strikes to whales, entanglement, fishing impacts and vessel activities were identified, discussed, and evaluated. Each warrants attention, tracking, study, and, in some cases, management action.
- Currently, impacts to the sanctuary ocean environment stemming from the changing state of the climate are the biggest concern of the sanctuary.
- Addressing identified issues, threats, and challenges to sanctuary resources and communities will require participation by, and coordination with, a variety of agencies and organizations.
- Cordell Bank National Marine 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 Cordell Bank National Marine Sanctuary?

Participate in the Management Plan Process

- Learn about the management plan review process and submit comments during public comment periods. View comments submitted by tribal governments, the public, and stakeholders.
- 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 fishermen 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.

Photo: Robert Lee/BAUE