Cordell Bank National Marine Sanctuary

Vessel Traffic

Management Issue

Vessel activity has the potential to impact resources of the Cordell Bank National Marine Sanctuary (CBNMS or Sanctuary) resources through discharge of materials and oil spills, acoustic and physical disturbance to wildlife, and direct injury or mortality of marine mammals due to collision

Large vessels such as cruise ships and cargo vessels have the potential to directly impact marine mammals. Photo credit: Bob Wilson.

Description

The southeast corner of the Sanctuary is located approximately 5 nautical miles from the terminus of the northern shipping lanes that funnel commercial vessels into and out of San Francisco Bay; therefore, all inbound and outbound traffic using the northern lanes passes through the Sanctuary on their approach to or departure from San Francisco Bay. There is a need to determine the potential overlap of vessel activity and areas of biological sensitivity to assess and mitigate the potential risks of vessel activity on Sanctuary resources.

Questions and Information Needs

1) What are the spatial and temporal patterns of vessel activity (by vessel type) within the Sanctuary?

2) What are the spatial and temporal patterns of noise produced by vessels within the Sanctuary?

3) What are the spatial and temporal patterns of seabird and marine mammal abundance within the Sanctuary?

4) Are there areas of overlap between high vessel use and areas of biological sensitivity (e.g., foraging areas)?

5) Are there persistent physical features (e.g., upwelling plume front) that have the potential to accumulate oil and other discharge materials?

6) Do marine mammals and seabirds concentrate their feeding at persistent physical features?

7) How does the application of dispersants influence oil dispersal within the Sanctuary and the resulting impacts on pelagic and benthic communities?

Scientific Approach and Actions

- Compile Automatic Identification System (AIS) data to determine spatial and temporal patterns of vessel activity (by vessel type) within the Sanctuary
- Conduct vessel-based and aerial surveys to determine the extent and type of Sanctuary use by vessels that do not participate in the AIS system
- Compile vessel-based survey data to determine spatial and temporal patterns of seabirds and marine mammals.
- Produce environmental sensitivity maps (including temporal component) that illustrate regions needing additional protection from vessel disturbance and discharge, including oil spills
- Investigate the patterns of persistent oceanographic features (i.e., fronts) and the response of marine organisms (zooplankton, fishes, seabirds, marine mammals) to these physical features
- Refine available oil dispersal simulation models to predict surface and sub-surface patterns of oil dispersal and concentration within the sanctuary with and without the application of dispersants
- Conduct passive acoustic monitoring to identify and quantify sources of underwater anthropogenic noise.

Potential Key Partners and Information Sources

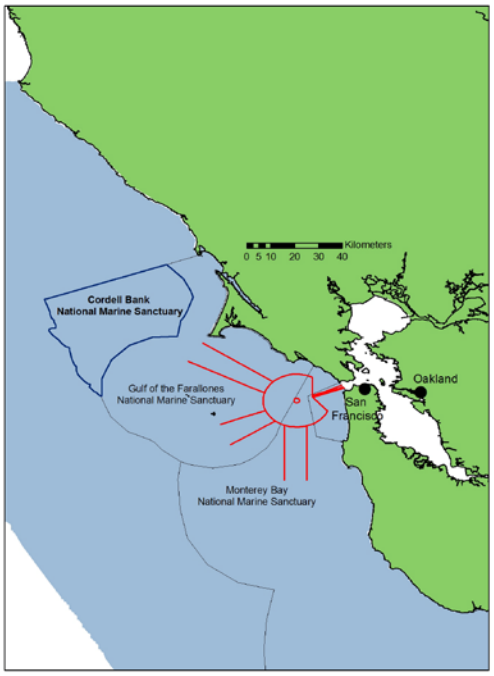
University of California Davis-Bodega Marine Laboratory, PRBO Conservation Science, United States Coast Guard, California Department of Fish and Game-Office of Spill Prevention and Response, NOAA Office of Response and Restoration, Scripps Institution of Oceanography, NOAA Fisheries, GFNMS, MBNMS

Management Support Products

- Integrated maps of vessel activity, persistent physical features and areas of biological concentration
- Environmental sensitivity maps that can be used to assess the potential impacts of vessel activities, including oil spills, physical and acoustic wildlife disturbance, and collision with marine mammals
- Simulation models to predict surface and sub-surface patterns of oil dispersal with and without the application of dispersants
- Baseline acoustic information that can be used to determine the potential disturbance levels to marine mammals

Planned Use of Products and Actions

- Develop policies, procedures and regulations to minimize the effects of vessel activities on Sanctuary resources
- Utilize environmental sensitivity maps and simulation models to evaluate the potential impacts of vessels on Sanctuary resources
- Consult with United States Coast Guard to ensure that proposed vessel management policies are compatible with safe and legal maritime practices
- Evaluate scenarios of oil dispersal to improve ability to respond to potential future oil spills and guide mitigation and restoration activities
- Utilize research results to develop educational products that will inform the public about potential impacts of vessels on the Sanctuary and practices that can be undertaken to minimize these impacts



Location of the Sanctuary relative to the shipping lanes (in red) that funnel vessel traffic into and out San Francisco Bay. Image credit: CBNMS

Program References

CBNMS Management Plan

- Ecosystem Protection Action Plan, strategy EP-2, EP-4, EP-7
- Conservation Science Action Plan, strategy CS-7

CBNMS Condition Report

- Levels of human activities that may influence water quality (question 4)
- Status of key species (question 12)
- Levels of human activities that may influence living resource quality (question 14)

ONMS Performance Measures

- By 2015, 100% of the sanctuary system is adequately characterized.