



Fact Sheet

# Biological Harbor Survey



Port of  
**LONG BEACH**  
The Green Port

## Overview

The Port of Long Beach partners with the Port of Los Angeles to conduct periodic surveys of the health of the harbor's natural environment. The surveys sample water quality, sediments, invertebrates, fish, birds and mammals in both harbors.

The first harbor-wide survey was conducted in 2000, the second in 2008 and most recently in 2013 to 2014. The Port and resource agencies that oversee wildlife in the harbors use these results to evaluate progress in improving the health of the natural resources under their stewardship, consistent with the goals of the Green Port Policy.

## Background

The 2013 - 2014 survey looked at water quality and sediments, fish and other sea life, birds, and marine mammals at up to 32 stations in the inner and outer harbors of both ports over three seasons.

This survey, like the ones before it, also documents the presence of non-native species.

## Water Conditions

As a result of ongoing pollution control efforts, water quality continues to improve.

Oxygen in the water exceeded 5 milligrams per liter, the state's criterion at most locations. The only values lower than the standard were found near the bottom of the water column, and there were far fewer instances of this measurement than in any previous survey.

Chlorophyll concentrations usually exceeded 5 milligrams per cubic meter of water, indicating high phytoplankton concentrations, which help support the rich fish and invertebrate populations of the harbors. Despite concerns about toxic red tides, there was no evidence of harmful algal blooms in the harbor.

## Fish

The study sampled pelagic fish (free-swimming), demersal fish (bottom-dwelling), shallow-water fish (only in Los Angeles Harbor), and fish eggs and larvae.

Almost three quarters of a million pelagic fish, or 3 tons of fish, belonging to 35 different species, were collected by the sampling teams. As in previous studies, northern anchovy made up over 90 percent of the catch. Anchovy is an important food for several bird species, some marine mammals, and other fish species, and supports a bait fish industry. Grunion, mackerel, topsmelt and jacksnipe made up most of the remaining pelagic fish in from the survey.

The sampling of bottom-dwelling fish captured nearly 20,000 belonging to 58 different species and weighing over a ton. As in previous surveys, white croaker and queenfish were among the most abundant species — the surveys caught over 8,000 white croaker, which constituted 41 percent of the demersal catch.

White croaker and queenfish are not significant components of the coastal fish community outside the port complex, so their abundance in the harbors suggests that the harbor environment is particularly favorable to these species.

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Fish larvae were abundant in the harbor. The most abundant of the 79 types of larval fish that were identified were gobies, anchovies, blennies and white croaker. These are all common adult inhabitants of the harbor.

## Life on the Harbor Bottom

As in previous years, most of the animals living in the sediments — the benthic infauna — are marine worms, which make up roughly 50 percent of the organisms, and tiny shrimp-like creatures called amphipods, although clams and snails are also abundant. A total of 264 species were collected, which is similar to the results of previous studies.

Marine worms was more than twice as abundant at the shallow-water sites created by the Ports as it was at the other stations, indicating that those sites are valuable habitat for fish, birds, and other marine organisms. There were also more species and greater species diversity at the shallow water habitats, further emphasizing the high quality of these created habitats.

Values of a measure called the Benthic Response Index were below the threshold value of disturbance everywhere in Long Beach Harbor, indicating healthy conditions. This finding highlights a dramatic improvement in water and sediment quality. Up until the 2000 survey, large areas of the Inner Harbor showed significant signs of pollution stress. Now those areas closely resemble the Outer Harbor in terms of habitat quality.

## Life on Rocks and Pilings

The survey identified 558 species of plants and animals living on the rocks and pilings in the harbor. This was 60 percent more in than in the 2008 survey and nearly twice the number identified in 2000. Abundance followed a similar pattern, especially at stations in the inner harbor areas, where the average abundance of 375

organisms per sample was seven times as great as it was in 2000 and over twice as many as in 2008. On average, there are over 46,000 plants and animals on a square meter (roughly a square yard) of the rocky shorelines of the harbor.

The differences in abundance and number of species between inner harbor and outer harbor stations was much lower than in past surveys, indicating that there is less of a difference in habitat quality than in the past.

## Flourishing Giant Kelp

The amount of giant kelp in Long Beach and Los Angeles harbors has increased dramatically over the last 15 years. In the spring of 2014 beds of giant kelp covered 132 acres of Outer Harbor waters. That coverage was much greater than in previous years, when maximum kelp coverage reached only 27 acres in 2000 and 80 acres in 2008.

By summer 2014 the kelp beds had shrunk to 46 acres, somewhat smaller than in summer 2008 (52 acres) but much larger than in 2000 (17 acres). Shrinkage as water temperatures increase is a normal seasonal pattern for kelp, but the scientists conducting the study suggest that it was likely intensified in 2014 by the unusually warm water temperatures that occurred in the region.

## Birds in Abundance

The current study observed over 76,000 birds belonging to 96 species. Many of the species were just migratory visitors — only 29 species occurred year-round, and just 10 species made up 90 percent of the sightings. Western gulls remain the most numerous birds in the harbor, accounting for nearly one quarter of all sightings. Other abundant species include brown pelican, western grebe, elegant tern, Heerman's gull, California gull, Brandt's cormorant, double-crested cormorant and surf scoter.

## Marine Mammals

Dolphins, seals and sea lions are the most common marine mammals in the harbors. Dolphins are not abundant in the harbors — fewer than 60 were seen during the study. The two species that were seen — common and bottlenose — were observed only in the Outer Harbor area; they rarely venture into the constricted channels and basins of the Inner Harbor.

California sea lions were the most abundant marine mammal in the harbors. The 587 animals seen on the 12 monthly surveys accounted for two-thirds of all marine mammals spotted during the study. They were present throughout the harbor, resting on buoys, docks, riprap, and even on the bows of cargo ships, and were often seen either following fishing boats or hanging around fish markets and restaurants. The 223 harbor seals observed resting on the rocks of the breakwaters or foraging along the rocky shorelines represented a quarter of all marine mammal sightings.

## Non-Native Species

Among the hundreds of species collected in the 2013 - 2014 study, 27 were introduced (non-native or non-indigenous) species and 95 were cryptogenic species (native range or region of origin unknown). The number of species known to have been introduced was similar to the numbers from the 2000 and 2008 studies. Introduced species occurred across all of the types of biological resources that were sampled with the exception of marine mammals. Overall, less than 10 percent of the species documented in the harbor-wide studies are considered introduced.

Most introduced species are not abundant and do not appear to be taking over their habitats. Exceptions include Asian clam, brown seaweed and the bay mussel.

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