

Minke Whales in San Francisco Bay Area Waters

The Question: *What factors affect the distribution, size, and ecological role of minke whale populations within San Francisco Bay Area waters?*



Minke Whale (*Balaenoptera acutorostrata*)

One of the most widely distributed baleen whale species in North American waters; the minke whale (*Balaenoptera acutorostrata*) is also among the smallest in size. Minkes are one of the few whale species that live year-round in waters off the coast of Golden Gate National Recreation Area and Point Reyes National Seashore. The California-Oregon-Washington population of minke whales – also known as the COW stock – is thought to be composed of relatively non-migratory residents.

Like all baleen whales, minke whales are seasonal feeders and carnivores. Their distribution generally follows that of their prey

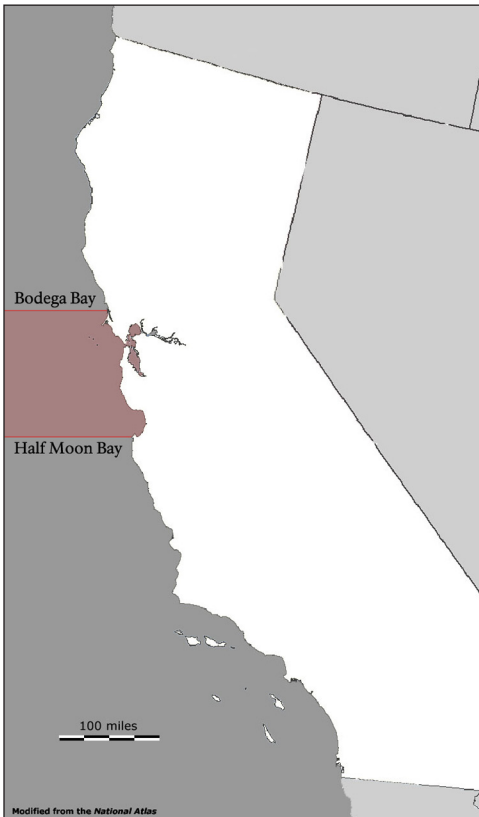
during spring, summer, and fall, and the availability of mates in the winter. The population structure of the minke whale is thought to be more complex than that of other baleen whale species. There is considerable evidence of group segregation by sex, age, and reproductive condition. The COW stock is estimated at 898 individuals, with a minimum population estimate of 544. Within the COW stock, whales appear to be distributed in small distinct populations, generally numbering in the tens of individuals. It is not clear to what extent these smaller populations are genetically distinct from one another. What is clear though is that local disturbances can have a profound effect on the local population, leading to mortality or displacement to other areas.

The Project: *The goal of the San Francisco Bay Area Minke Whale Project (SFBAMWP) is to understand the ecological roles of minke whales in the context of central and northern California marine ecosystems.*

Although the National Park Service doesn't directly monitor the various whale species within park boundaries, it is part of a much larger network of research groups that work together to understand the roles that whales play in ocean ecosystems. One partner group, The Minke Whale Foundation, carries out research projects such as SFBAMWP. One of the main goals of this project is to estimate population size of minke whales in the San Francisco Bay region.



Minke Whale (*Balaenoptera acutorostrata*)



SF Bay Area Minke Whale Project Operational Range (in red)

Working within a range that spans between Bodega Bay and Half Moon Bay, the goal of SFBAMWP is to develop a model that describes the role of the COW-stock as top predators in their ecosystem. The project's methods include assessments of population size, individual residency patterns, feeding rates, foraging behavior, and top-down effects of the whale's predation. This collection of data will be used to develop a "mass-balance" model that tracks the effects that top level predators have on lower trophic levels.

Population size is measured by means of photo identification techniques, and these data are also used to suggest whether the whales are migrants to or residents of a specific area. As feeding rates are calculated and recorded over time, changes in foraging behavior and success rates may indicate an environmental shift in the habitat.

The Results: *SFBAMWP is an on-going project that will study minke whale life history for many years to come.*

Researchers in Washington State found that minke whales tend to go after food in two different ways: bird-associated feeding and lunge feeding. In bird-associated feeding whales take advantage of schools of small fish driven to the surface by diving birds and

predatory fish that are hunting them from below. Gulls show where these schools of fish are as they feed on them from above. Lunge feeding is when whales concentrate prey near the surface themselves, and then lunge through the schooled fish with their mouths open.

Which technique the whales use depends on how prey is distributed in the different environments where they feed. In areas where prey is concentrated but not always present the whales rely more heavily on bird-associated feeding. In places where prey is patchy but predictably available they tend to use lunge feeding. Individual whales often return to the same feeding sites and will use whichever tactic maximizes their chances of finding food in that area.

The minke whale project is continuing this work in San Francisco Bay Area waters to determine whether whales here also use these tactics. SFBAMWP researchers also hope to implement satellite tags and 3-D dive profiles into future research efforts in order to better understand the species when they are out of close range.

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Additional Resources:

San Francisco Bay Area Minke Project: <http://bayareaminkewhale.org/>

Northeast Pacific Minke Whale Project: <http://www.northeastpacificminke.org/>

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