



Whales of the Bay Area's National Parks

The Importance: *The waters off the coast of Golden Gate National Recreation Area and Point Reyes National Seashore are characterized by very high levels of seasonal productivity. This uniquely fruitful ecosystem supports an extensive network of marine life, including a variety of migratory and resident whale species throughout different times of the year.*



Humpback Whale (*Megaptera novaeangliae*)

The ecological productivity of the Bay Area's offshore habitats is matched by very few other places on the planet. The central California coast is the only eastern boundary upwelling ecosystem in North America, and one of only four in the entire world. Upwelling areas have extremely high levels of productivity (food and nutrients), and many animals come into the bays of Golden Gate National Recreation Area and Point Reyes National Seashore to feed or reproduce. The quarter mile that the boundaries of these parks extend offshore encompasses only a small portion of whale habitat, so the National Park Service is part of a much larger collaborative network of whale research, monitoring, and protection groups.

The region is important to whales not only during periods of upwelling, but during non-upwelling times as well. Gray whales (*Eschrichtius robustus*) migrate through between breeding areas in Baja and feeding grounds in Alaska. Humpback whales (*Megaptera novaeangliae*) feed in the area during the non-upwelling period in autumn when sardines are abundant. Sperm whales (*Physeter macrocephalus*)

occur offshore likely feeding on squid, regardless of season. Orcas (*Orcinus orca*) have been observed migrating off national park shores throughout the year, and several groups of minke whales (*Balaenoptera acutorostrata*) and harbor porpoises (*Phocoena phocoena*) are permanent residents in the area.



Orcas (*Orcinus orca*)

In the past several decades there have been changes in the timing and intensity of upwelling events, which could have dramatic effects on the species that depend on these processes. Although it is uncertain whether these changes are caused by natural or anthropogenic forces,

research indicates that potentially significant human impacts are indeed taking place. Industrial pollution, fisheries, shoreline development, dams, and invasive species are just a few. It is important for researchers to understand the extent to which these and other human activities are impacting these ecosystems, and to carefully develop mitigation and protection policies accordingly.

Conservation: *Marine Protected Areas (MPA) have been established to help respond to threats facing marine habitats in order to protect the marine ecosystems that support an abundance of marine mammal species.*

In 1999, California passed the Marine Life Protection Act, becoming the first state in the U.S. to establish a comprehensive system of offshore protected areas. MPAs are valuable tools for conserving marine resources as part of an ecosystem approach to management, and provide additional partnership opportunities to facilitate regional and national cooperation.

In establishing MPAs, researchers have acknowledged the importance of having a geographically dispersed network of protected sites to protect the extensive collection of habitats occupied by migratory marine species. Not only is it important to establish protected areas within our own waters, but a nationally established system increases the ability to protect and conserve species – such as whales – whose life cycles span multiple jurisdictions and ecosystems.

Looking Ahead: *Because there are many uncertainties in predicting future effects of climate change it is important to develop a large network of protected areas to best prepare for a variety of different possible scenarios.*

Rising sea temperatures may change the location, timing, and extent of coastal upwelling, and potentially change the food webs upon which whales and many other marine species depend. While it is not certain if these trends relate directly to climate change, they do fit well into predicted trends suggested by existing research. To help address these threats, the national system of MPAs has two primary areas of focus for present and future goals: strengthening and coordinating existing MPAs, and identifying significant resource areas where additional protection might be needed. The first gap assessment on the West Coast started in 2009, and is expected to take place through 2010.

Additional Resources:

To learn more about the National System of MPAs see the Marine Protected Areas of the United States website: <http://mpa.gov>

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Figure 1: Map of San Francisco Bay Area MPAs