

Sanctuary Description



Introduction

The Hawaiian Islands are the world's most isolated island archipelago, born of ancient volcanoes and inhabited by animals and plants derived from ancestors that found their way here over thousands of miles of ocean. According to scientists, the shallow, warm waters surrounding the main Hawaiian Islands constitute one of the world's most important habitats for the endangered humpback whale. Nearly two-thirds of the entire North Pacific population of humpback whales migrates to Hawai'i each winter. Here, they engage in breeding, calving and nursing activities critical to the survival of their species.

The Sanctuary is also home to a fascinating array of marine animals, corals and plants, some of which are found nowhere else on Earth. Its cultural heritage includes Native Hawaiian traditions of living in harmony with the sea. Its waters invite activities such as diving, boating and snorkeling, and support commercial uses such as fishing and shipping.

Environment

The Sanctuary is actually a series of five noncontiguous marine protected areas distributed across the main Hawaiian Islands (see following section for discussion on more specific boundaries). The total area of the Sanctuary is 1,370 square miles. Encompassing about half of the total Sanctuary area, the largest contiguous portion of the Sanctuary is delineated around Maui, Lāna'i, and Moloka'i. The four smaller portions are located off the north shore of Kaua'i, off Hawai'i's Kona coast, and off the north and southeast coasts of O'ahu. While this description of the Sanctuary's natural environment and human use is generalized for the Sanctuary as a whole, it is important to note that upon more detailed inspection, each of the five Sanctuary areas has its own distinct natural character and social significance.

The waters around the main Hawaiian Islands of Kaua'i, O'ahu, Hawai'i, Maui, Moloka'i, Lāna'i, and Kaho'olawe constitute one of the world's most important North Pacific humpback whale (*Megaptera novaeangliae*) habitats and a primary region in the U.S. where humpbacks reproduce.

Boundary

The boundary of the Sanctuary consists of the submerged lands and waters off the coast of the Hawaiian Islands seaward from the shoreline, cutting across the mouths of rivers and streams:

- (1) To the 100-fathom (183 meter) isobath from Kāilio Point eastward to Mōkōlea Point, Kaua'i;
- (2) To the 100-fathom (183 meter) isobath from Pu'a'ena Point eastward to Māhie Point, and from the Kapahulu Groin in Waikīkī eastward to Makapu'u Point, O'ahu;
- (3) To the 100-fathom (183 meter) isobath from Cape Hālawā, Moloka'i, south and westward to 'Īlio Point, Moloka'i; southwestward to include Penguin Banks; eastward along the east side of Lāna'i to the waters seaward of the three nautical mile limit north of Kaho'olawe, to the Hanamanaio Lighthouse on Maui, and northward along the shoreline to Līpoa Point, Maui;
- (4) To the deep water area of Pailolo Channel from Cape Hālawā, Moloka'i, to Līpoa Point, Maui, and southward;
- (5) To the 100-fathom (183 meter) isobath from 'Upolu Point southward to Keāhole Point, Hawai'i.





All commercial ports and small boat harbors in the State of Hawai'i are excluded from the Sanctuary boundary.

The waters around the island of Kaho'olawe are not included in the Sanctuary at this time. NOAA has and will continue to work closely with the Kaho'olawe Island Reserve Commission, the State of Hawai'i, and the Navy to assess whether Kaho'olawe should be included in the Sanctuary at a later date.

The establishment of the Sanctuary in no way conveys, or intends to convey, to NOAA any title or ownership of Hawaii's submerged lands. These lands, including those known as ceded lands, continue to be held in trust by the State of Hawai'i. The Sanctuary will exist as a co-steward of the Sanctuary and its resources. Should the status of the submerged lands change at some time in the future (i.e., lands are conveyed to a sovereign Hawaiian nation), the Sanctuary will work with the appropriate entities to redefine its role if necessary.

Geology

The Hawaiian Islands formed one by one as the Pacific Plate of the Earth's crust moved northwestward over a stationary "hot spot." At the hot spot, magma from deep within the Earth periodically pushes through the crust to the surface, forming an island. Over millions of years, the Pacific Plate has worked like a very slow conveyor belt, moving islands away from the hot spot and providing fresh areas of oceanic crust over the hot spot so that new islands can emerge.

This hot-spot phenomenon explains why the islands get older as one travels northwestward from the Big Island (the youngest island). The oldest parts of the Big Island are estimated to be no more than half a million years old, while Maui, O'ahu and Kaua'i are about 1, 3 and 5 million years old, respectively.

Because the Big Island still resides over the hot spot, volcanic activity is still observed there, but the movement of the Pacific plate continues, and a new undersea volcano (Lō'ihi) appears to be growing into an island off the Big Island's southeast coast.

Climate and Oceanography

Hawai'i is famous for its comfortable climate. Air temperatures over Sanctuary waters throughout the State rarely exceed 90°F in the warm season (May through September) and rarely dip below 65°F during the cool season (October through April). The main climate controls in Hawai'i are latitude, the Pacific Ocean, and altitude. Lying between 19° and 22° north latitude, the main Hawaiian Islands are on the edge of the tropics and within the area where trade winds blow northeasterly about eight days out of ten. Because of the islands' low latitude, the longest and shortest days of the year differ by only about two hours. The Pacific Ocean supplies moisture to the air, and, because of its high heat-storage capacity, keeps temperatures within a relatively narrow range. Most differences in temperature from place to place in Hawai'i result primarily from altitude, where cooler areas are typically found at higher elevations.



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Rainfall is the one climatic feature in Hawai'i that is highly variable. Kaua'i's Mount Wai'ale'ale, where average annual rainfall is around 450 inches per year, is one of the wettest spots on Earth. However, at the Sanctuary headquarters in Kīhei, Maui, average annual rainfall is only about 15 inches per year. The wettest time of year for most of Hawai'i is during the cooler months, from November through February, but the Kona Coast of the Big Island, where the southeastern portion of the Sanctuary is located, experiences a peak in rainfall during the warmer months of March through August. In general, average annual rainfall over Sanctuary waters is between 15 and 60 inches per year.

Ranging from about 70° and 80° F, the surface waters of the Sanctuary are relatively warm. However, water temperatures at the deepest depths of the Sanctuary (around 600 feet) can be as cold as 40°F. The large-scale surface current patterns in the Hawaiian Islands generally go from east to west, but winds and tidal flows add to their complexity.

Marine Ecosystems

With its boundaries including waters from the shoreline to depths of 600 feet in many areas, the Sanctuary encompasses a variety of marine ecosystems, including seagrass beds and coral reefs. Much of the Sanctuary has fringing coral reefs close to shore and deeper coral reefs offshore. Hawai'i's coral reefs are noted for their isolation and endemism. Over 25% of all Hawai'i's reef animals are endemic, meaning that they are found nowhere else on earth.

In Hawai'i's reef ecosystems, corals and coralline algae are the dominant reef-building organisms. The corals found in the Sanctuary include finger coral (*Porites compressa*; nā pōhaku puna), cauliflower coral (*Pocillopora meandrina*; nā ko'a), and lobe coral (*Porites lobata*; nā pōhaku puna). Other important components of the Sanctuary's reef ecosystems include algae (nā limu), marine invertebrates, such as shrimp (nā 'ōpae), lobster (nā ula), crabs (nā pāpa'i), and sea urchins (nā wana), fish (nā i'a), such as parrotfish (nā uhu), wrasses (nā hīnālea), damselfish (nā 'ālo'ilo'i), surgeon fish (nā kala), goatfish (nā weke/kūmū), jacks (nā āholehole), and sharks (nā manō). Endangered Hawaiian monk seals (nā 'īlioholoikauaua) and green sea turtles (nā honu) are also important members of the Sanctuary's reef community.

The deeper reefs lie in the "twilight zone" of the Sanctuary below 200 feet. These deep-reef ecosystems have their own unique assemblage of corals, algae and marine invertebrates, many of which are depth-adapted versions of species found at shallower depths. Deep-reef fish include squirrelfish (nā 'ala'ihī), soldierfish (nā 'ū'ū), surgeonfish (nā kala), snappers (nā uku), and emperors (nā mū). Endangered Hawaiian monk seals (nā 'īlioholoikauaua) and threatened green sea turtles (nā honu) also frequent the Sanctuary's deeper reefs.

Human Uses and Economic Value of the Sanctuary

People use the resources found within the Sanctuary in a variety of ways (for a more complete description, please see the Description of the Affected Environment contained in the original management plan for the Sanctuary). Native Hawaiians have long had close relationships with their marine environment. Nowadays, the marine area included in the Sanctuary is used extensively for ocean recreation, fishing, and shipping. In Sanctuary waters off of Maui, for example, commercial tour operations feature whalewatching, sportfishing, parasailing, and snorkeling. Commercial fishing, cruise ships, and commercial shipping also use the same area. The Department of Defense also uses Hawaiian waters for a variety of national defense purposes. One of the main purposes of the Sanctuary is to work with



government agencies and the private sector to ensure that these activities are conducted in ways that have the least possible impact on humpback whales and their habitat.

The Sanctuary's goal of protecting humpback whales and their habitat is very important for the continued success of Hawai'i's whalewatching industry. A recent study (NOAA 2000) estimates that commercial whalewatching tours in Hawai'i support as many as 390 jobs and generate as much as \$27 million annually in direct, indirect, and induced revenues. Through its management activities, the Sanctuary actively protects the humpback whale's significant economic contribution to the Hawaiian islands.

Sanctuary Purpose

The HINMSA designated the Sanctuary for the primary purpose of protecting humpback whales and their habitat within the Hawaiian Islands marine environment. Recent research indicates that the population of humpback whales in Hawaiian waters during the 1999-2000 season was between approximately 4,500 and 6,500 individuals (Mobley *et al.*, in press). The same research indicates that the population has increased an average of approximately 7% per year from 1993 through 2000.

The NMSP has defined humpback whale habitat, for purposes of Sanctuary management, as:

"those areas in the waters around Hawai'i that provide space for individual and population growth and normal behavior of humpback whales, and include sites used for reproductive activities, including breeding, calving and nursing."

Sanctuary Resources

The Hawaiian Islands have at their heart the only National Marine Sanctuary dedicated to whales and their habitat. The annual migration of the humpback whales, from their summer home in icy Alaskan waters to their Hawaiian winter destination, is a miraculous feat. They can cover nearly 3,000 miles of open ocean in less than two months' time, but how they find their way remains a mystery. The reason why they come here, however, is more easily understood.

Like all whales, humpbacks are mammals, and belong to the baleen whale suborder, *Mysticeti*. They graze on zooplankton and small fishes in temperate and subpolar waters. Nearly all of the baleen whales migrate some distance to warmer tropical waters to breed and give birth. The humpback whale population that comes to Hawai'i each winter is part of a much larger group that lives in the North Pacific Ocean, with feeding aggregations distributed in the Gulf of Alaska, southeast Alaska, and central California. Many members of these feeding groups migrate southward to the tropical waters off Japan and the Ryukyu Islands, as well as to Hawai'i, Mexico, and Central America in roughly parallel tracks, with very little exchange between the breeding grounds. The Sanctuary has been established in the heart of the largest breeding grounds for the humpback whale. It is estimated that approximately 2,000 to 5,000 individuals come here each year, a significant portion of the total North Pacific population of 6,000 to 10,000 whales.

Humpback whales are easy to identify in Sanctuary waters. In comparison to other whales, they are actually medium-sized, with females tending to be larger than males, averaging 45 feet in body length and weighing approximately 40 to 45 tons. The calves are typically 14 feet at birth, and may weigh as much as 2 tons. Mature humpbacks are dark gray to black on their backs and sides, with mostly dark



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undersides, although some individuals have splotches of white. Humpback whales have the longest pectoral flipper of all the whales—about one third the length of the body—which can be mottled white on the upper and lower surface. The undersides of their tail flukes are as distinctive as our fingerprints, and range from all black to all white, with a whole gamut of splotching and scarring in between. The trailing edges of the flukes have a slight “S” curve and many knobby scallops and average 15 feet in width. When humpbacks dive, they often show their flukes, which researchers photograph and use to identify individuals as they come and go the Hawaiian Islands and elsewhere.

Humpback whales are classified in the *Balaenopterid* family, which also includes the world’s largest whale—the great blue whale—and the smallest baleen whale, the minke. A family trait is an expandable throat with pleats that allows these whales to engulf huge quantities of prey and water, more than 500 gallons per gulp. The early Norwegian whalers called them “rorqual” or red whales because these pleats appear pink when fully stretched by a mouthful of prey. The whales strain this writhing mass of food by pushing the water out through the baleen (the keratin structures that grow from their top jaws instead of teeth), using their one-ton tongues like a plunger. Once the food is separated from the seawater, the whales swallow it and the process begins again. A remarkable humpback trait is its cooperative feeding strategy, during which several individuals “herd” the fish in a “bubble net” that the whales create by swimming in ever smaller concentric circles.

The humpbacks rarely feed, however, during their stay in Hawaiian waters. Some observers have reported seeing them feed on schools of small fish, but like all baleen whales, humpbacks have adapted to fasting during their migration breeding seasons, while living off their fat reserves. Undoubtedly, they would eat while they were here if food was plentiful, but tropical waters are typically nutrient-poor and don’t support the shoals of fish and krill that humpbacks feed on during the summer months. When males engage in competitive behaviors on the breeding grounds they sometimes fill their mouths with water to posture, that is, to make themselves look bigger. Some people may mistake this behavior as feeding activity.

Another distinguishing feature of all humpback whales is their bumpy rostrum, or top jaw, which is dotted with fleshy knobs called tubercles. The early whalers also noticed these knobs and called them “stove bolts.” No other whales have them, and the fact that they house a strand of hair and many nerve endings leads scientists to speculate that they may serve some sensory function. The final feature that easily distinguishes humpbacks from other whales, and for which they have received their common name, is the way they curve their back and tailstock region when preparing to dive.

Humpback whales are also easy to see in Hawaiian waters because they exhibit many dramatic behaviors. On their breeding grounds, the males compete for access to receptive females, slamming each other with their powerful tail flukes, lunging at and chasing each other, and producing unique and mysterious songs. The females and young are also active, slapping the surface of the water with their long pectoral fins and tails, and hurling their gargantuan bodies into the air in spectacular breaches. Female humpbacks are also very nurturing mothers. They stay in close contact with their young while on the breeding grounds, suckle their calves for up to a year, and defend and protect them from predators and rowdy suitors.





The 11 1/2-month gestation period of the humpback whale ensures that females impregnated in a given winter will give birth the following winter in the warm, sheltered breeding grounds. Calves grow quickly, sustained by their mother's fat-rich milk, and usually double in size during their first year. After feeding all summer in the cooler, nutrient-rich waters off the Gulf of Alaska, a newly weaned calf may follow its mother back to the breeding grounds the following winter. The calves also seem to learn the feeding areas their mother's prefer. By the time they reach young adulthood, between the ages of four and six, some whales are ready to breed themselves, and the cycle continues.



Sanctuary Vision, Goals, and Objectives



Introduction

The vision, goals, and objectives that follow are based on those in the original management plan. They have been updated by the Sanctuary staff and SAC to reflect the current Sanctuary framework and needs.

These goals and objectives also served as the foundation for the development of the strategies in the action plans found in the following section. The action plans are presented along thematic lines, not strictly in line with each goal and objective; however, each action plan or strategy description references which of the goals and objectives it addresses. Table 2 presents this in a graphic format.

Sanctuary Vision

The Sanctuary works collaboratively to sustain a safe and healthy habitat for the North Pacific stock of humpback whales (*koholā*). As a community of ocean stewards, the Sanctuary strives to achieve a balance of appropriate uses, inspired care taking, enlightened understanding, and effective education to ensure the continued presence of the *koholā* for future generations. The Sanctuary endeavors to do this with harmony, hope, respect, and *aloha o ke kai* (love of the sea).

Goals and Objectives

GOAL 1: CONSERVE, ENHANCE AND PROTECT HUMPBACK WHALES AND THEIR HABITAT.

- Objective 1.1: Identify and reduce threats to the humpback whale and its habitat.
- Objective 1.2: Establish and maintain a damage assessment and restoration function.
- Objective 1.3: Enhance permit and project review procedures.

GOAL 2: PROMOTE AND COORDINATE RESEARCH TO ENHANCE THE UNDERSTANDING OF HUMPBACK WHALES AND THEIR HABITAT, AND TO IMPROVE MANAGEMENT DECISION-MAKING.

- Objective 2.1: Develop a detailed research and monitoring program.
- Objective 2.2: Evaluate current and prioritize future research needs.
- Objective 2.3: Develop ways to share information and promote coordination among researchers.

GOAL 3: ENHANCE PUBLIC AWARENESS, UNDERSTANDING, AND APPRECIATION OF HUMPBACK WHALES, THEIR HABITAT AND THE SANCTUARY.

- Objective 3.1: Interpret the natural history and social and cultural importance of humpback whales.
- Objective 3.2: Promote public stewardship and an ocean conservation ethic, to help protect humpback whales and their habitat, and encourage voluntary compliance with regulations protecting them.
- Objective 3.3: Develop education and awareness programs for multiple audiences, including the Native Hawaiian community.



Table 2: Matrix of Strategies, and Goals and Objectives

	Natural Resource Protection					Education and Outreach					Research and Monitoring				Cultural Resource Enhancement					Administration				
	NRP-1	NRP2	NRP-3	NRP-4	NRP-5	EO-1	EO-2	EO-3	EO-4	RM-1	RM-2	RM-3	RM-4	CRE-1	CRE-1	AD-1	AD-2	AD-3	AD-4	AD-5				
Goal 1	[Blue bar]																							
Objective 1.1	●																							
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Objective 1.3		●				△																		
Goal 2									[Blue bar]															
Objective 2.1										●														
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Objective 6.6																								
Objective 6.7																								
Goal 7																								
Objective 7.1																								

[Blue bar] = General support for a goal

● = Specific support for an objective

△ = Secondary support for an objective

Vision/Goals/Objectives

Objective 3.4: Encourage information exchange among educators.

Objective 3.5: Collaborate with local, regional and national organizations to provide education and outreach programs.

Objective 3.6: Establish procedures for identifying, selecting, and sponsoring education projects.

GOAL 4: FOSTER ALL USES OF THE SANCTUARY COMPATIBLE WITH PROTECTION OF THE HUMPBACK WHALES AND THEIR HABITAT (INCLUDING USES BY NATIVE HAWAIIANS CUSTOMARILY AND TRADITIONALLY EXERCISED FOR SUBSISTENCE, CULTURAL AND RELIGIOUS PURPOSES).

Objective 4.1: Provide relevant information about Sanctuary uses, use policies, and regulations.

Objective 4.2: Work with the Native Hawaiian community to identify customary and traditional uses of the marine environment and educate the general public about these uses.

GOAL 5: ESTABLISH MECHANISMS TO FOSTER COORDINATION AND COLLABORATION AMONG FEDERAL, STATE, AND LOCAL RESOURCE MANAGEMENT AGENCIES, NATIVE HAWAIIANS, ACADEMIA, PRIVATE SECTOR, GENERAL PUBLIC, NON-GOVERNMENT ORGANIZATIONS, AND OTHER ORGANIZATIONS TO ACHIEVE SANCTUARY GOALS.

Objective 5.1: Establish MOUs, interagency agreements, and other agreements for coordination among agencies relevant to Sanctuary management, to better protect humpback whales and their habitat, and to enhance enforcement of regulations protecting them.

Objective 5.2: Provide opportunities to engage the SAC in planning, evaluation, and other appropriate activities.

GOAL 6: DEVELOP AND MAINTAIN INFRASTRUCTURE AND RESOURCES TO ACHIEVE SANCTUARY GOALS.

Objective 6.1: Provide adequate staffing to achieve Sanctuary goals.

Objective 6.2: Maintain and develop additional facilities and equipment.

Objective 6.3: Provide training and build skills for staff, volunteers, and SAC.

Objective 6.4: Encourage volunteer participation in Sanctuary programs.

Objective 6.5: Maintain comprehensive planning processes.

Objective 6.6: Maintain an organizational structure that achieves Sanctuary goals effectively and efficiently.

Objective 6.7: Expand revenue enhancement programs and opportunities.

GOAL 7: IDENTIFY AND EVALUATE RESOURCES AND ECOSYSTEMS FOR POSSIBLE INCLUSION IN THE SANCTUARY.

Objective 7.1: Develop and implement a process that identifies and evaluates resources for possible inclusion in the Sanctuary.

