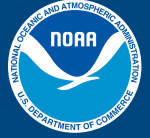


Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

HAWAIIAN ISLANDS HUMPBACK WHALE NATIONAL MARINE SANCTUARY



MANAGEMENT PLAN 2020



hawaiihumpbackwhale.noaa.gov

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Cover photo: Hawaiian Islands Humpback Whale National Marine Sanctuary protects humpback whales and their habitat. Photo: Ed Lyman/NOAA, under NOAA Permit #782-1719



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EXECUTIVE SUMMARY



Humpback whale calves stay near their mothers and nurse for up to a year. Photo: Ed Lyman/NOAA, under NOAA Permit #782-1719

Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) was established in 1992 to protect humpback whales (*Megaptera novaeangliae*) and their marine habitat. The sanctuary achieves its mission through globally recognized research projects, the national entanglement response network, popular education and outreach programs, and strong community partnerships. The National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS) and the state of Hawai'i Department of Land and Natural Resources (DLNR) co-manage HIHWNMS.

The HIHWNMS Management Plan guides the sanctuary's actions to achieve its mission. The current HIHWNMS Management Plan was completed in 2002 (National Ocean Service [NOS], 2002). In 2015, after a five-year public process, the sanctuary released a new, draft management plan for public comment (ONMS, 2015). That version of the management plan included a proposed shift to ecosystem-based management as well as five boundary additions. After reviewing the public and state agency comments on the proposed actions, ONMS withdrew the 2015 draft plan (ONMS, 2016).

This revised Final Management Plan (2020) returns to the primary reason for Congress' designation of the sanctuary in 1992: protecting humpback whales and their marine habitat. Although the Hawai'i distinct population segment (Hawai'i population) of humpback whales is no longer listed under the Endangered Species Act, many conservation threats remain.

This revised Final Management Plan includes four action plans that outline the proposed activities that will guide sanctuary staff for the next five years. The action plans are summarized below. Details of each action plan can be found beginning on page 10.

Humpback Whale Research and Response Action Plan (WR) – The sanctuary will continue to develop and implement research and monitoring on, for example, the health, behavior, and population trends of humpback whales. The sanctuary will continue to lead a community-based response network to free large whales from life-threatening entanglements. The sanctuary will also build upon its scientific partnerships and find new ways to disseminate information locally.

Education and Outreach Action Plan (EO) – The sanctuary will continue its workshops, citizen/community science projects, lecture series, field trips, exhibits, hands-on educational displays, and more, to reach a broad cross-section of our island communities. In this action plan, the sanctuary proposes to expand its education and outreach programs at its new Līhu‘e (Kaua‘i) Ocean Discovery Center, at its existing Kihei (Maui) Visitors’ Center, and on outer islands. The sanctuary will also work with cultural partners to better incorporate Hawaiian knowledge and perspectives, as appropriate.

Living Cultural Traditions Action Plan (CT) – The Living Cultural Traditions Action Plan proposes activities to better understand and incorporate current and traditional Hawaiian cultural knowledge, perspective, and practices into sanctuary programs, using the foundational Hawaiian chant, the Kumulipo, as a framework.

Management Effectiveness Plan (ME) – HIIHWNMS will ensure effective and well-planned sanctuary operations and adequate physical infrastructure (e.g., facilities and boats) to support effective management.

INTRODUCTION



Humpback whales are an integral component of the Hawaiian archipelago ecosystem. Photo: Jason Moore/NOAA, under NOAA Permit #15240

The humpback whale is one of the most well-known marine creatures in the world. Living in every ocean, humpbacks annually migrate from colder summer waters to warmer winter waters to calve and mate. Humpback whales in Hawai'i come from nutrient-rich feeding areas in the Bering Sea, the Aleutian Islands, and southeast Alaska. Male humpbacks are known for their complex and hauntingly beautiful “songs.” Humpbacks are a favorite of whale-watchers and whale-lovers around the world because of distinctive behaviors like breaching, spy-hopping, and stretching their long pectoral fins above the water’s surface.

In traditional Hawaiian religion, the humpback whale (koholā) is one of the physical manifestations or symbolic associations (kino lau) of the god Kanaloa. One of the four major gods (akua), Kanaloa is many things. He is the ocean, ocean currents, and subterranean and oceanic depths (Au, 2019). He is associated with ocean navigation and winds for the traditional Hawaiian sailing canoes (wa'a). He is also a healer. With the god Kāne, he finds fresh drinking water, and is part of the cycle of life and death.

In the ancient chant, the Kumulipo, the koholā and the sperm whale (palaloo) are specifically mentioned. The Kumulipo provides the Hawaiian perspective on relationships between dozens of marine, freshwater, and terrestrial plants and animals. It is a window to history and genealogy, and is foundational to the place-based Hawaiian world view.

In the winter months, tourists flock to Hawai'i to see humpback whales. Whale-watching has become a significant component of the local economy. A 1999 study estimated the annual

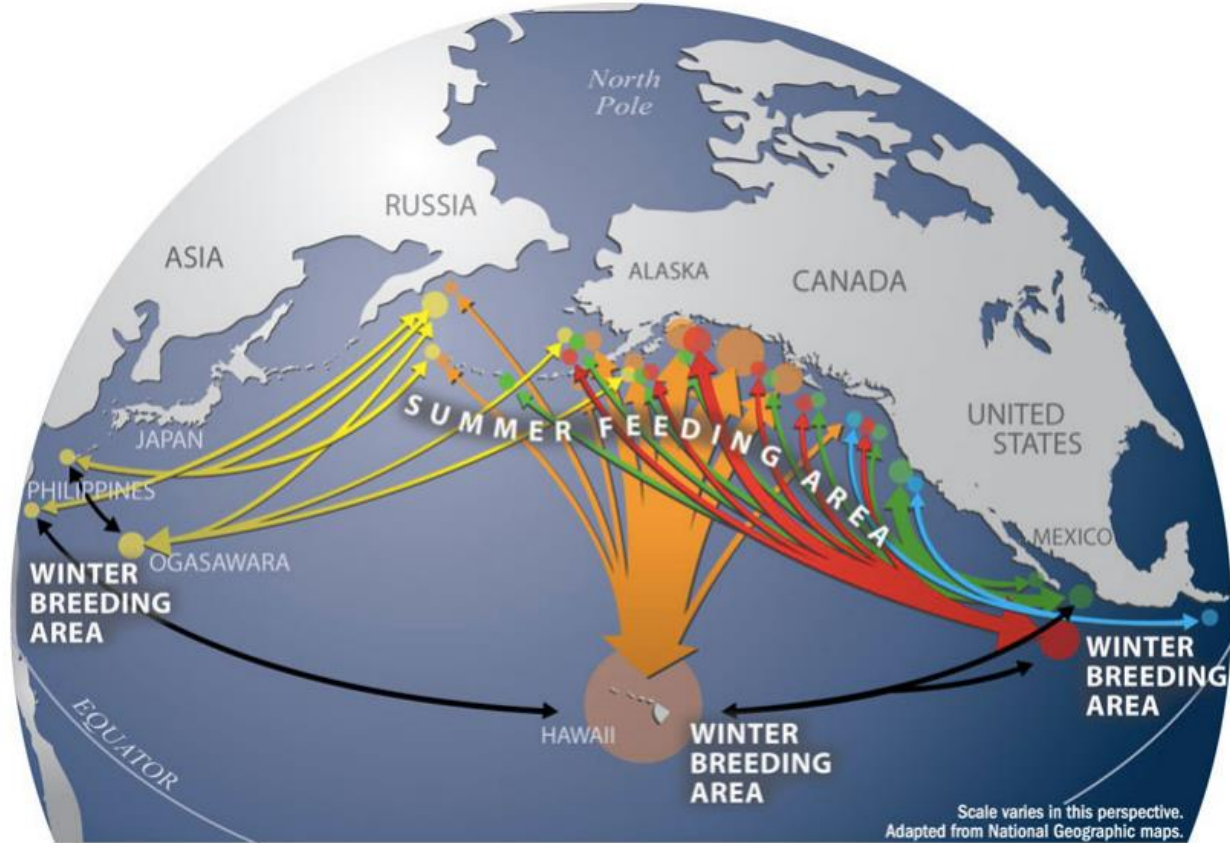
economic contribution of whale-watching trips in Hawai'i at \$19 to \$27 million – equivalent to roughly \$30 to \$42 million in 2020 dollars. In a corresponding survey, approximately 75% of the Maui dinner cruise and snorkeling tour passengers knew that humpbacks would be present during their visit, and over 50% indicated that the whales were a factor in their decision to come to Hawai'i. Converted to 2020 dollars, dinner cruises and snorkeling tours state-wide contribute an additional \$120 - \$205 million to the state's economy, more than the coffee, macadamia nut, and charter fishing sectors combined (National Agricultural Statistics Service [NASS], 2018,2019; NOAA Fisheries, 2019).

Less understood, but perhaps even more important, is the role humpback whales play in the marine food web of Hawai'i. Whales contribute vital nutrients just by swimming in the water -- their skin is constantly sloughing. Mackerel scad (*Decapterus macarellus*, or 'ōpelu) and other small fishes are regularly seen schooling near whales; it is thought that they are feeding on the sloughed skin. Whale births and deaths also contribute large pulses of micronutrients such as iron, important in what is typically characterized as an iron-poor marine environment.

Industrial whaling severely depleted world-wide humpback whale populations, some to near extinction. In the 1970s and 1980s, the species gained protection under U.S. law and globally. As part of the efforts to conserve the species, in 1992, Congress created HIHWNMS to provide added protection for humpback whales throughout their Hawaiian breeding grounds. The sum of these conservation actions allowed the Hawai'i population of humpbacks to recover to the point that, in 2016, the population was removed from the U.S. endangered species list.

Today, HIHWNMS offers popular educational and outreach programs to thousands of Hawaiian residents and visitors; conducts important research on the health and behavior of the Hawai'i population; and ensures that the public, resource managers, and policy makers understand the challenges these majestic creatures experience.

HIHWNMS also plays a vital role in the continued conservation of humpback whales across the North Pacific: coordinating large-scale research projects with national and international partners, sharing information with scientists tracking the whales in their feeding grounds, and leading a regional entanglement network. As highly migratory animals, humpback whales are subject to a range of marine environmental conditions and problems. Changes in one area of a humpback whale's range can affect the entire population, regardless of the conditions in other areas. These factors include ocean temperature or acidification, food availability, fishing gear, floating marine debris, or increased shipping traffic and plastic trash. In this way, humpback whales help us understand the relationships between and among these ocean issues as few other species can. The sanctuary is essential to the continued conservation of these incredible animals.



Each summer, whales from three different breeding populations, Hawai'i, Mexico, and Okinawa/Philippines, return to the same summer feeding areas in the north Pacific. Image: NOAA

BACKGROUND

National Marine Sanctuaries

National marine sanctuaries are special areas set aside for the long-term protection and conservation of America's ocean and Great Lakes. They are an essential part of our environmental and cultural heritage, and part of our legacy to future generations. Congress passed the National Marine Sanctuaries Act (NMSA) in 1972¹. Amended and reauthorized several times, the NMSA authorizes the Secretary of Commerce to designate national marine sanctuaries to protect marine and Great Lakes areas with significant ecological, historical, scientific, cultural, archeological, educational, recreational, or esthetic qualities. The NMSA also supports education, public outreach, and research.

There are 14 national marine sanctuaries, including HIHWNMS, managed by NOAA's ONMS. Some sanctuaries, including HIHWNMS, are co-managed with state partners.

NATIONAL MARINE SANCTUARY SYSTEM



The National Marine Sanctuary System is a network of 14 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments. Image: NOAA

¹ 16 U.S.C. § 1431 et seq.

Hawaiian Islands Humpback Whale National Marine Sanctuary



The Hawaiian Islands Humpback Whale National Marine Sanctuary main office and visitors' center is located in Kihei, on the island of Maui. Photo: Dayna McLaughlin/NOAA

Establishment

On November 4, 1992, the U.S. Congress passed the Hawaiian Islands National Marine Sanctuary Act,² which established HIHWNMS. The primary purpose of the sanctuary was – and is – to protect humpback whales and their habitat. The humpback whale was federally listed as Endangered in 1970.³

Aside from the primary purpose of protecting humpback whales, Congress also created the sanctuary to (1) educate and interpret for the public the relationship of humpback whales to the Hawaiian Islands' marine environment; (2) manage human uses of the sanctuary consistent with the Hawaiian Islands National Marine Sanctuary Act; and (3) identify marine resources and ecosystems of national significance for possible inclusion in the sanctuary.

In Hawai'i, some members of the public were concerned about what a sanctuary would mean to the people of Hawai'i. Therefore, Congress allowed the secretary of commerce, in consultation with the governor of Hawai'i, to modify the boundaries of the sanctuary. In the early 1990s, numerous public meetings and hearings were held on each of the main Hawaiian Islands. The public was assured that the sanctuary would incorporate only existing restrictions to protect humpback whales and their habitat. Those restrictions primarily dealt with approaching and harassing whales, discharge of wastes into the water, and alteration of the seabed. On June 5,

² Public Law 102-587, Subtitle C, as amended by Public Law 104-283.

³ Humpback whales were first listed under the Endangered Species Conservation Act (ESCA) in 1970, and then again in 1973, when the Endangered Species Act replaced the ESCA.

1997, Hawai'i Governor Benjamin Cayetano formally approved of the sanctuary in state waters, designating the current boundaries at the same time (Figure 1).

Boundaries

HIHWNMS covers approximately 1,370 square miles of state and federal waters off the coasts of six of the Hawaiian Islands (Figure 1). The sanctuary includes the waters and submerged lands. The sanctuary boundary extends seaward from the shoreline to the 100-fathom (600 feet, or 183 meters) isobath (depth), with some limitations, additions, and exclusions. Detailed maps of the sanctuary waters around each island are included in Appendix B.

Limitations:

- Around the island of Hawai'i, only includes waters and submerged lands to the 100-fathom (600 feet or 183 meters) isobath from Upolu Point southward to Keāhole Point.
- Around the island of Kaua'i, only includes waters and submerged lands to the 100-fathom (600 feet or 183 meters) isobath from Ka'ilio Point eastward to Mōkōlea Point.
- Around the island of O'ahu, only includes waters and submerged lands to the 100-fathom (600 feet or 183 meters) isobath from Pua'ena Point eastward to Māhie Point, and from the Kapahulu Groin eastward to Makapu'u Point.

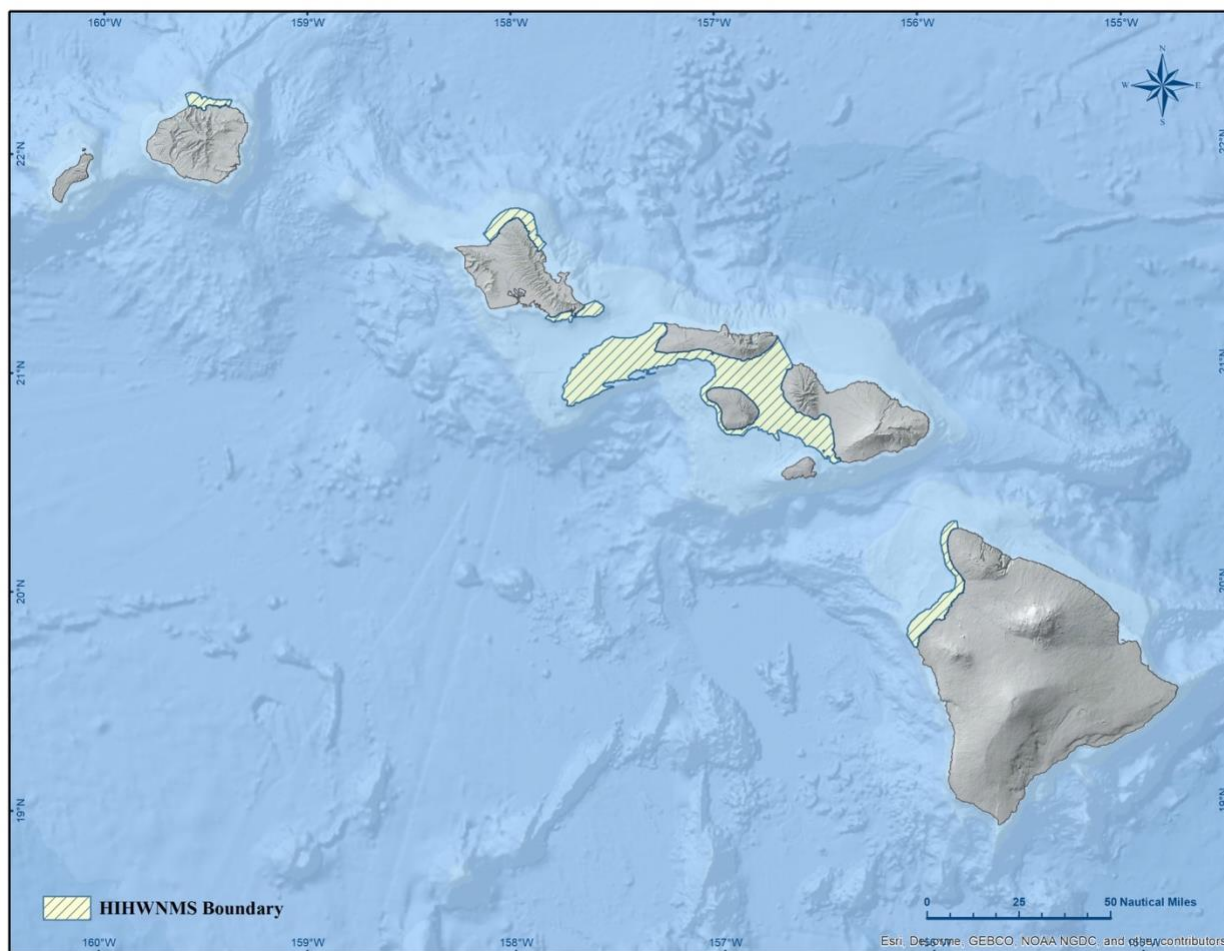


Figure 1. HIHWNMS boundaries showing federal and state waters. See Appendix B for detailed maps for each island. Image: HCRI/NOAA

Additions:

- Includes the deep water area of Pailolo Channel from Cape Halawa, Moloka'i, to Lipoa Point, Maui, southward to Cape Hanamanioa, and westward along Lāna'i.
- Includes Penguin Bank, Moloka'i.

Exclusions:

- Cuts across the mouths of rivers and streams.
- All state of Hawai'i ports and harbors (Table 1).
- The area within three nautical miles of the upper reaches of the wash of the waves on the shore of Kaho'olawe Island.

Table 1. Hawai'i Division of Boating and Ocean Recreation (DOBOR) small boat and commercial harbors, and Hawai'i Department of Transportation (DOT) commercial harbors excluded from, but adjacent to, HIHWNMS waters. Harbors not listed are not adjacent to HIHWNMS waters.

Island	DOBOR Public Small Boat Harbor	DOBOR Commercial Harbor	DOT Commercial Harbor
Maui	Lahaina Mā'alaea		
Lāna'i	Manele	Kaumalapau	Kaumalapau
Moloka'i	Kaunakakai Hale o Lono		Kaunakakai
Hawai'i	Kawaihae		Kawaihae

Regulations

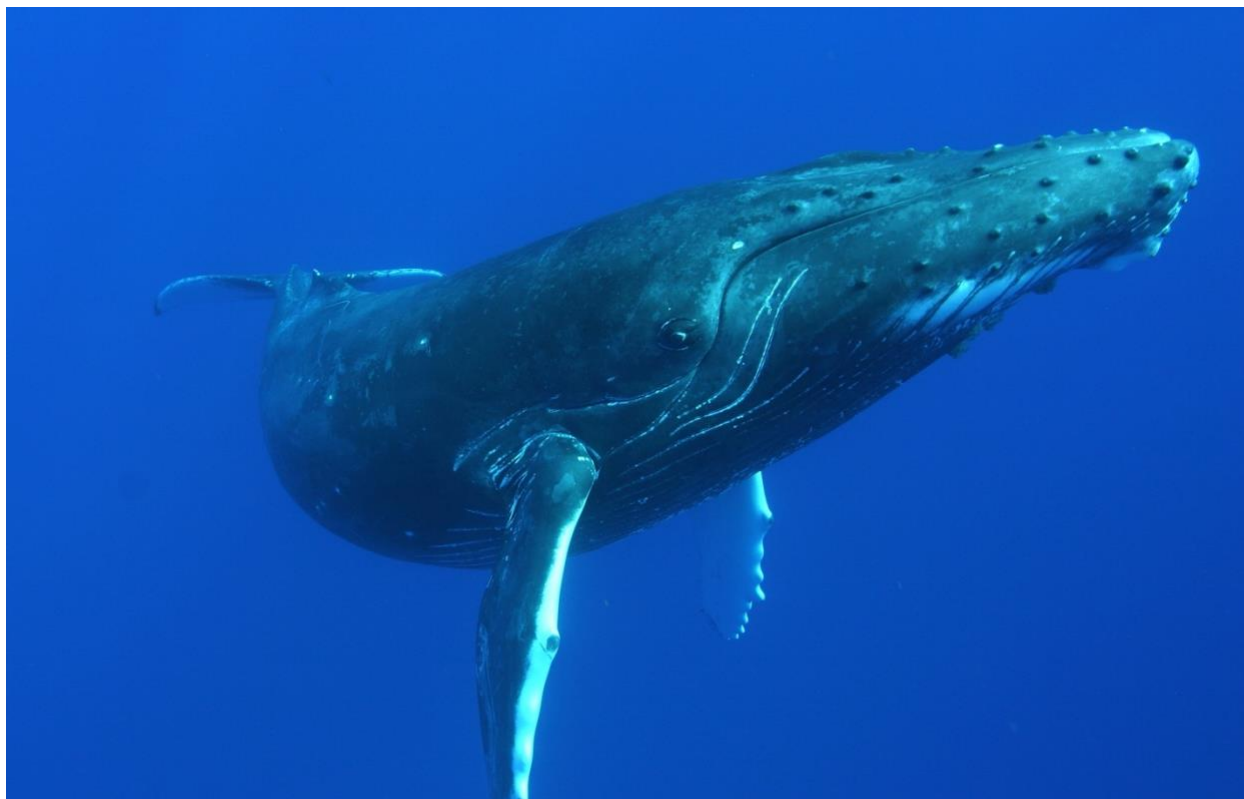
The primary objective of the sanctuary's regulations⁴ is to protect the humpback whale and its habitat. The regulations apply to “activities affecting the resources of the sanctuary or any of the qualities, values, or purposes for which the sanctuary was designated, in order to protect, preserve, and manage the conservation, ecological, recreational, research, educational, historical, cultural, and aesthetic resources and qualities of the area.”

NOAA's National Marine Fisheries Service (NOAA Fisheries) – not the sanctuary – is responsible for the protection of whales under the U.S. Marine Mammal Protection Act (MMPA). Congress passed the MMPA in 1972 to maintain the health and stability of the marine ecosystem by preventing marine mammal populations from declining beyond the point “at which they cease to be a significant functioning element in the ecosystem.” NOAA Fisheries has the sole authority to authorize “take” of humpback whales. For example, NOAA Fisheries issues research permits that allow scientists to approach whales at distances shorter than 100 yards. The sanctuary does not issue permits.

The following activities are prohibited and thus unlawful for any person to conduct or cause to be conducted in the sanctuary:

⁴ 10 C.F.R. § 922.180 *et seq.*

1. Approaching, or causing a vessel or other object to approach, within the sanctuary, by any means within 100 yards of any humpback whale except as authorized under the MMPA, as amended, 16 U.S.C. § 1361 *et seq.*
2. Operating any aircraft above the sanctuary within 1,000 feet of any humpback whale except when in a designated flight corridor for takeoff or landing from an airport or runway or as authorized under the MMPA.
3. “Taking” (harassing, harming, pursuing, hunting, shooting, wounding, trapping, capturing, collecting, injuring, or killing; or attempting to engage in such conduct) any humpback whale in the sanctuary, except as authorized under the MMPA; and
4. Possessing within the sanctuary (regardless of where taken) any living or dead humpback whale or part thereof taken in violation of the MMPA.
5. Discharging or depositing any material or other matter in the sanctuary; altering the seabed of the sanctuary; or discharging or depositing any material or other matter outside the sanctuary if the discharge or deposit subsequently enters and injures a humpback whale or humpback whale habitat, provided that such activity:
 - a) requires a federal or state permit, license, lease, or other authorization; and
 - b) is conducted:
 - 1) without such permit, license, lease, or other authorization; or
 - 2) not in compliance with the terms or conditions of such permit, license, lease, or other authorization.



Humpback whales rely more on their senses of hearing, smell, and echolocation than their eyesight. Photo: Ed Lyman/NOAA, under NOAA Permit #782-1719

Vision, Mission, and Goals

The purpose of the sanctuary – to protect humpback whales and their habitat – drives its vision, mission, and goals. The **vision** is an inspired statement representing the future direction of the Sanctuary. The **mission** defines the sanctuary’s purpose and focus of its work. The sanctuary **goals** are the unifying elements of successful sanctuary management.

Vision

The sanctuary works collaboratively to sustain a healthy North Pacific stock of humpback whales and their habitat. As a community of ocean stewards, the sanctuary strives to achieve a balance of appropriate uses, protection, understanding, and effective education to ensure the continued presence of these culturally, ecologically, and economically important animals for future generations.

Mission

HIHWNMS protects humpback whales and their habitat through a range of activities in conservation, research, education, and outreach efforts to enhance public awareness, understanding, and appreciation of humpback whales and the Hawaiian Islands marine environment.

Goals

- Maintain or improve the condition of humpback whales and their habitat.
- Increase awareness of humpback whales and support for the mission of HIHWNMS.
- Advance collaboration and coordination.

Federal and State Co-Management

One of the caveats for Governor Cayetano’s approval of HIHWNMS was that it would be co-managed by the state of Hawai‘i. In 1998, the state created an intergovernmental compact agreement with NOAA to “...clarify the relative jurisdiction, authority, and conditions of the NOAA-state partnership for managing the sanctuary” (NOAA & State of Hawai‘i, 1998). The compact agreement recognized that “...no federal, state, or local title or authority to manage and regulate submerged lands, resources, or activities, has been limited, conveyed or relinquished.”

Regarding the co-management of the sanctuary, the compact agreement resolved that (in part, and paraphrased):

1. No state or local funding would be required to manage the sanctuary.
2. The governor would designate a state employee to work in consultation with the sanctuary manager (now superintendent) as an equal partner in the oversight of sanctuary operations and management activities throughout the sanctuary.
3. The state and NOAA would manage the sanctuary through a cooperative partnership.
4. The co-managers would resolve any management issues resulting in policy conflicts between the state and NOAA.

In 2002, NOAA and the state wrote a memorandum of understanding (MOU) to establish procedures and protocols for co-management of the sanctuary (NOS & DLNR, 2002). This MOU outlined the shared responsibilities of both parties: resource protection, communication and coordination, research and monitoring, education and outreach, and operations.

ONMS provides the annual funding for the state co-manager position to the Department of Land and Natural Resources (DLNR). The position is located within DLNR's Division of Aquatic Resources (DAR). Annual project objectives and funding are defined in a 2016 memorandum of agreement (MOA) between NOAA-NOS and DAR (ONMS & State of Hawai'i, 2016), which is amended each year.

Sanctuary Advisory Council

The HIHWNMS Sanctuary Advisory Council (SAC) is a community-based advisory group made up of 19 voting members, their alternates, and 15 non-voting members (Table 2). Members represent ocean user groups, scientists, environmentalists, communities, government agencies, and the public at-large.

The role of the SAC is to provide advice and recommendations to the federal sanctuary superintendent on sanctuary operations and programs. SAC members also serve as liaisons between their communities and sanctuary staff to promote communication on key issues and concerns that may affect research, resource protection, management actions, education, and economic opportunities.

All members are appointed by the ONMS director in consultation with the state of Hawai'i.

Table 2. HIHWNMS Sanctuary Advisory Council members.

Non-Government (voting unless otherwise indicated)	Government (non-voting unless otherwise indicated)
Business/Commerce Commercial Shipping Conservation Education Fishing Hawai'i Island Representative O'ahu Island Representative Kaua'i Island Representative Lāna'i Island Representative Maui County Representative Moloka'i Island Representative Native Hawaiian Ocean Recreation Research Tourism Whale Watching Youth At-Large (non-voting)	HIHWNMS, Superintendent HIHWNMS, Co-Manager, Hawai'i Department of Land and Natural Resources NOAA Fisheries, Office of Law Enforcement NOAA Fisheries, Pacific Islands Regional Office Office of Hawaiian Affairs (voting) Papahānaumokuākea Marine National Monument, Superintendent Hawai'i Department of Business Economic Development & Tourism Hawai'i Department of Health Hawai'i Department of Transportation, Harbors Division Hawai'i Office of Planning U.S. Army Corps of Engineers U.S. Coast Guard U.S. Navy Western Pacific Regional Fisheries Management Council (voting)

Hawai'i Department of Land and Natural Resources

The Hawai'i Department of Land and Natural Resources (DLNR) is responsible for managing and caring for the state lands, minerals, streams, freshwater resources, ocean waters, and coastal areas (except commercial harbors) of Hawai'i, as well as its terrestrial and aquatic plants, animals, and insects. DLNR manages nearly 1.3 million acres of state lands and coastal waters as well as 750 miles of coastline (the fourth-longest in the country). The mission of DLNR is to

“enhance, protect, conserve and manage Hawaii’s unique and limited natural, cultural, and historic resources held in public trust for current and future generations of visitors and the people of Hawai‘i in partnership with others from the public and private sectors.”

DLNR contains 10 divisions and offices that work to accomplish its mission: Aquatic Resources (DAR), Boating and Ocean Recreation (DOBOR), Bureau of Conveyances (BOC), Conservation and Coastal Lands (OCCL), Conservation and Resources Enforcement (DOCARE), Engineering Division (ENG), Forestry and Wildlife (DOFAW), Historic Preservation Division (SHPD), Land Division (LAND), and State Parks (SP). In addition, the DLNR administers the Aha Moku Advisory Committee, the Commission on Water Resource Management, the Endangered Species Recovery Committee, the Hawai‘i Historic Places Review Board, Island Burial Councils, the Kaho‘olawe Island Reserve Commission, the Legacy Land Conservation Commission, and the Natural Area Reserves Systems Commission.

The governing entity of DLNR is the Board of Land and Natural Resources (board). The board members are citizens appointed by the governor representing the four main land districts of Hawai‘i (Hawai‘i, Kaua‘i, Maui, O‘ahu) and three at-large. The chairperson of the board is also the executive head of DLNR. The board reviews and acts on non-routine department submittals; for example: land leases or administrative rule changes.

Hawaiian Island Humpback Whale National Marine Sanctuary Management Plan



The long pectoral fins of a humpback whale vary in color from pure white to pure black. In Hawai'i, pure white fins are not as common as they are in the Atlantic. Photo: Ed Lyman/NOAA, under NOAA Permit #782-1719

Background

National marine sanctuaries must periodically revise management plans and/or regulations to ensure that they continue to best conserve, protect, and enhance their nationally significant living and cultural resources. The HIHWNMS Management Plan was last updated in 2002 (NOS, 2002).

Previous Planning Efforts

In 2015, after a five-year public process, the sanctuary released a new draft management plan for public comment (ONMS, 2015). That version included a proposed shift to ecosystem-based management as well as five boundary additions. After reviewing the public and state agency comments on the proposed actions, ONMS decided to withdraw this draft management plan from consideration (ONMS, 2016). HIHWNMS has continued to operate under its 2002 management plan.

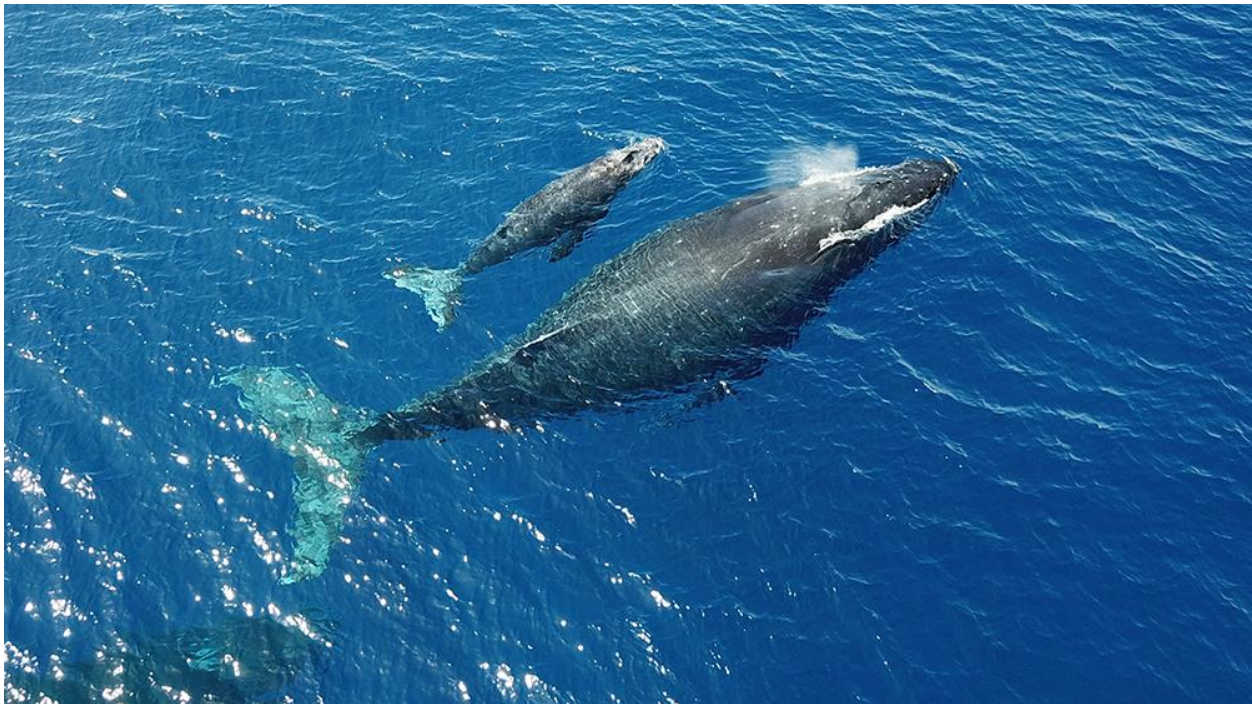
This revised Final Management Plan (2020) returns to the sanctuary’s original focus: protecting humpback whales and their marine habitat. This revised plan does not change existing HIHWNMS regulations, nor does it change the boundaries. This new plan recognizes the strides made since 2002. It is a forward-looking document to meet the needs, opportunities, and challenges of the next five years. It is designed to be adaptable.

Plan Content

This management plan is organized into four action plans. These action plans are designed to directly address current priority resource management issues and guide management of the sanctuary throughout the coming years:

1. Humpback Whale Research and Response (WR);
2. Education and Outreach (EO);
3. Living Cultural Traditions (CT); and
4. Management Effectiveness (ME).

Each action plan consists of a desired outcome, objectives, strategies, and activities. The desired outcome describes the future state of the sanctuary that one would expect to see if the action plan were fully implemented. The objective describes the process to achieve the desired outcome by focusing on a particular aspect or process of sanctuary programs or operation. The strategy is the overall course of action that helps direct the specific activities to achieve the objectives and desired outcome. An activity is the direct and specific action taken by sanctuary managers and staff to address an issue and achieve the related objective and desired outcome.



Female humpback whales generally give birth to a single calf every two to three years. Photo: Ed Lyman/NOAA, under NOAA Permit #782-1719

Humpback Whale Research and Response Action Plan (WR)



A sanctuary scientist uses a long pole to take a tiny piece of skin from the back of a humpback whale for genetic analysis. Photo: Anke Kuegler/NOAA, under NOAA Permit #20043

Desired Outcome

A healthy population of humpback whales that migrates to Hawai'i seasonally and is resilient to natural and human-caused threats.

Overview

The sanctuary is a respected leader in humpback whale research. Sanctuary scientists collaborate with scientific, educational, and local partners year-round to answer important questions about the health of and threats to the population of North Pacific humpback whales that migrate to Hawai'i. Sanctuary staff also lead a globally-recognized, regional entanglement response program.

The humpback whale population in Hawai'i rebounded after protections were put in place in the 1970s. The sanctuary recognizes that while the size of the North Pacific humpback whale population has increased over time, the animal's life history puts the population at risk from many threats. Humpback whales usually have only one calf every other year; therefore, population size increases slowly. They spend the majority of their time in nearshore waters. They regularly become entangled in nets, ropes, and fishing gear; some are killed every year from ship strikes. Seasonal feeding and their long migration to winter grounds means that they are at risk from changes in their food supply. In addition, our ocean is undergoing major changes that could adversely impact humpback whales and their habitat. The sanctuary is responsible for understanding the consequences of these and many other threats to humpback whales.

The sanctuary's current scientists are leaders in their respective fields. Over the coming years, sanctuary scientists will continue research and monitoring activities that will increase our understanding of the threats to humpback whales and their habitat. The sanctuary is ideally positioned to continue its role as a world leader in the protection, research, conservation, and management of this ecologically, culturally, and economically important species, because of its

extensive expertise, years of long-term monitoring, strong community engagement, well-established programs, and strong state-federal relationships.

Objective WR 1: Deepen and enhance understanding of humpback whales and their habitat.

Strategy

Increase understanding and monitor health of humpback whales and their habitat.

Activities

- **WR 1.1: Research**
 Continue to develop and implement research on humpback whales and their habitats; examples of this include: understanding long-term trends in the spatial and temporal occurrence of whales in HIHWNMS waters and beyond, using survey and acoustic methods (e.g. vessel transects, shore stations, passive acoustic monitoring, etc.); studying how whales occupy and use sanctuary habitats, using technologies such as acoustic, behavioral, and/or satellite tags; and quantifying the effect of humpback whales on marine and estuarine food webs in Hawai‘i.
- **WR 1.2: Health and risk assessment monitoring**
 Build upon the sanctuary’s humpback whale health and risk assessment efforts; examples include: visual/photo analysis of health indicators, wound/scar analysis from entanglement and vessel collision, drone work to better quantify body condition, and tagging studies towards measuring energetic and behavioral costs associated with various threats.
- **WR 1.3: Disseminating research and monitoring results**
 Compile and disseminate humpback whale research and monitoring findings; examples of this include: lead and participate in peer-reviewed scientific publications and technical reports, and present findings at scientific venues (e.g. conferences and workshops).
- **WR 1.4: Collaborations**
 Maintain and expand humpback whale research and monitoring collaborations locally, regionally, nationally, and internationally with non-governmental organizations, universities, state agencies, and/or other NOAA line offices; collaborations could include: research partnerships, sharing analytical resources, including students in research projects, and/or integrating information on humpback whales and their habitat across jurisdictional authorities and regions (e.g., Alaska, Northwestern Hawaiian Islands).
- **WR 1.5: Advisory groups and meetings**
 Establish and/or participate in advisory groups, working groups, meetings, and workshops to further identify and evaluate humpback whale research topics and needs; examples of such topics include: regional and global efforts to understand and mitigate threats to humpback whales (e.g. entanglement, vessel collisions, etc.), and/or whale abundance and habitat use (e.g. critical habitat) locally, regionally, and/or globally.

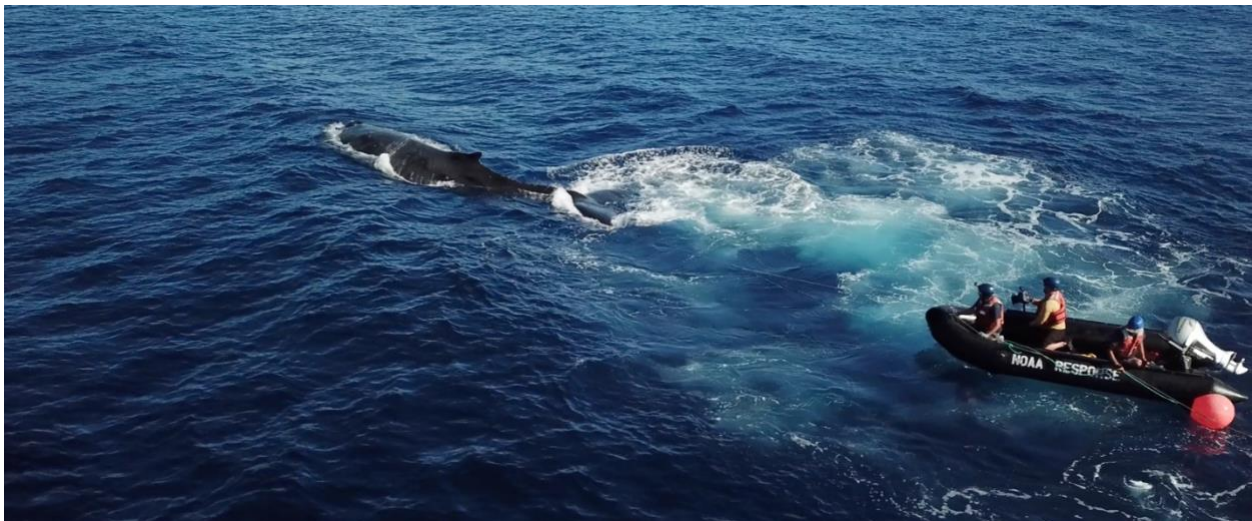
- **WR 1.6: Local knowledge**

Collaborate to incorporate local knowledge into the scientific understanding of humpback whales; examples include: train the on-water community to help report, assess, and document humpback whales that may be compromised or otherwise impacted by gear entanglement, vessel collisions, etc.; and engage local fishermen and commercial operators to share their whale behavior observations from remote/offshore areas.

- **WR 1.7: Citizen/community science**

Adapt or enhance citizen/community science programs to maximize public contribution to, and awareness of, the scientific understanding of humpback whales; examples include: pursuing greater data analysis of the Sanctuary Ocean Count; collaborating with other organizations engaged in similar citizen/community science efforts; and/or implementing new data collection efforts through engaging the on-water community.

Objective WR 2: Continue to evaluate, monitor, and respond to threats impacting humpback whales.



The sanctuary coordinates the community-based Hawaiian Islands Large Whale Entanglement Network. Network members train for years to learn skills necessary for the dangerous and important work of rescuing entangled humpback whales. Photo: Lee James/NOAA, under NOAA Permit #18786-02

Strategy

Understand threats to humpback whales and their habitat, in partnership with other agencies, communities, and stakeholders, in order to adapt management approaches to maintain a healthy humpback whale population in Hawai'i and beyond.

Activities

- **WR 2.1: Reduce harassment and promote best practices**

Continue, evaluate, and enhance methods for reducing harassment of whales and promoting best practices for the on-water community; for example: pursuing greater public outreach to increase awareness; recognize tour operators and other target groups that engage in best practices for whale watching (e.g., Whale SMART); encouraging the

on-water community to report whales in distress; promoting information sharing among vessel operators; collaborating with enforcement agencies to increase compliance with existing regulations and guidelines; assessing current HIHWNMS regulations to ensure consistency with state and other federal regulations; and working with the on-water community to improve recommended whale watching standards.

- **WR 2.2: Coordinate large whale entanglement response to mitigate threats**
 Continue to lead and coordinate a community-based network to free large whales from life-threatening entanglements, as well as to mitigate the risks and impacts of entanglements. This includes but is not limited to: increasing response capacity through staffing, community support, collaboration with state and federal partners, and equipment acquisitions (e.g., vessels); maintaining response safety record through continued training and proven standard operating procedures; and continuing to work with partners (including fishermen) locally, regionally, and globally, to better understand entanglement threats; working with managers, scientists, fishermen, and other stakeholders to implement mitigation measures (e.g. best practices and gear modifications) that will ultimately reduce the threat of entanglement, while also considering the socio-economic impacts associated with entanglements; and working closely with and under the authority of the Marine Mammal Health and Stranding Response Program under NOAA Fisheries’ Office of Protected Resources.
- **WR 2.3: Collaborate to identify and address other threats**
 Collaborate with local communities, scientists, agencies, and other stakeholders (including the SAC) to examine or identify threats to humpback whales and their habitat (for example: assessing the impact of anthropogenic ocean noise pollution or whale-vessel collisions on humpback whales, evaluating the effectiveness of potential mitigation measures, and providing updated recommendations for sanctuary management). Collaborate with regional and local partners to study, evaluate, and address the potential impacts from emerging threats occurring throughout the entire range of humpback whales (e.g. food supply fluctuations, or climate change).
- **WR 2.4: Provide expert knowledge**
 Provide input in a timeline provided by the requesting agency, on other agency projects, permits, regulation changes, etc., regarding actions that might pose a threat to humpback whales or their habitat. Although HIHWNMS is not a permitting agency, sanctuary staff provide expert knowledge when requested by federal and state partners on, for example: state permit applications for moorings or fish attraction devices in sanctuary waters, or federal regulatory matters related to humpback whales (e.g., post-delisting process and approach regulations).

Education and Outreach Action Plan (EO)



Volunteers eagerly scan the horizon for flukes, breaches, and spouts, while participating in the annual Sanctuary Ocean Count, one of the sanctuary's citizen science programs. Photo: Lisa Robertson

Desired Outcome

Increased public awareness of humpback whale biology, ecology, behavior, and threats to humpback whales and their habitat; increased collaborative outreach efforts with communities and user groups to promote stewardship of humpback whales and their habitat; and expanded place-based education.

Overview

Education and outreach have been the cornerstone of HIHWNMS since its inception over 25 years ago. The sanctuary's education programs seek to foster public awareness, understanding, and appreciation of humpback whales, the threats that impact them, and our management efforts to protect them. Sanctuary education programs also promote messages of marine conservation and sustainable use of the sanctuary's natural, historical, cultural, and archaeological resources. Educational centers at both sanctuary facilities (Maui and Kaua'i) feature educational displays and hands-on activities about the marine and coastal ecosystems of Hawai'i for the general public. Other examples of sanctuary education programs include naturalist trainings, public lecture series, teacher workshops, citizen/community science programs, school field trips, and participation in community festivals. HIHWNMS partners with other agencies, non-governmental organizations, cultural groups, and local community experts to design and offer its education programs.

One notable, successful education program is the Sanctuary Ocean Count, a citizen/community science project. Every year for over 20 years, hundreds of volunteers at approximately 60 sites on three islands, conduct a shore-based census during the peak months of the breeding season. The Sanctuary Ocean Count serves as an important tool to supplement scientific information gathered from other research activities.

Another important function of HIHWNMS' education and outreach program is working with ocean user groups (for example: tour boat operators, fishers, canoe clubs, ocean sport instructors, etc.) to reduce threats from marine commercial and recreational activities (e.g., ship strikes and floating gear) to humpback whales. The sanctuary hosts well-attended workshops on humpback whale approach and harassment rules, and best practices for boating during humpback whale season. Sanctuary staff and the commercial tour operators annually evaluate and update best practices for whale watching.

The Education and Outreach Action Plan presents activities designed to continue and expand the sanctuary's education and outreach programs.

Objective EO 1: Assess, enhance, and continue to implement current education and outreach programs.

Strategy

Continue sanctuary education and outreach programs that will increase awareness about and the need for continued conservation efforts in marine areas to support a healthy humpback whale population.

Activities

- **EO 1.1: Educators**
Assess, refine, and conduct workshops and training opportunities for educators to support their efforts to teach others about humpback whales and their habitat. Work with partners to include Hawaiian cultural perspectives in educator workshops and trainings, where and when appropriate.
- **EO 1.2: Ocean users**
Assess, refine, and conduct targeted, place-based workshops and training opportunities to ocean user groups (for example: tour boat operators, fishers, and canoe clubs) emphasizing threats to humpback whales in Hawaiian waters (e.g., ship strikes) and ways ocean users can mitigate threats. Educate ocean users on laws, rules, and regulations relating to humpback whales and/or responsible whale viewing guidelines, as appropriate.
- **EO 1.3: General public**
Assess, enhance, and provide a variety of education and interpretation opportunities for the general public including but not limited to: humpback whale biology and ecology, humpback whale habitat (the marine ecosystem), sanctuary research, conservation needs, new and emerging threats to humpback whales (for example: decreases in summer food sources), and the biology and ecology of other marine animals in the whales' environment. Work with partners to include Hawaiian cultural perspectives, where and when appropriate.
- **EO 1.4: Citizen/community science**
With conservation and community partners, expand community engagement (especially on outer islands) in the Sanctuary Ocean Count, Ocean Awareness Trainings, and other programs to raise public awareness about humpback whale habitat and protection.

- **EO 1.5: Science findings**
Compile and disseminate humpback whale research and monitoring findings to raise public awareness and engagement. Examples of this include: presenting findings at public events (e.g., the sanctuary lecture series), informing the sanctuary education/outreach program staff on the latest activities and findings for inclusion into education/outreach programming, and briefing managers and SAC members.

Objective EO 2: Expand education and outreach programs.

Strategy

Expand sanctuary education and outreach programming that results in broader community engagement; expand partnerships that enhance sanctuary staff's education and outreach programming, especially in terms of Hawaiian cultural knowledge; and create new opportunities for student engagement and training.

Activities

- **EO 2.1 – Expand education and outreach at existing and new locations**
Expand education and outreach programs and/or content at the new Kaua'i Ocean Discovery and existing Kihei (Maui) Visitors' Center; develop and support both new and existing programs and/or content on other islands.
- **EO 2.2: Experiential and place-based learning**
Work with education, conservation, and Hawaiian cultural partners to integrate experiential learning into K-16 education and outreach programs, in the classroom and in the field (for example: adjacent Hawaiian fishpond or beach environment), for both students and teachers, to make the sanctuary relevant to their learning experiences.
- **EO 2.3: Collaboration and partnerships**
Develop new opportunities for collaboration and partnerships to enhance education and interpretation opportunities around humpback whales and their habitat (for example: Hawaiian cultural groups, ocean user groups, or educational institutions).
- **EO 2.4: Internships and volunteer opportunities**
With educational, agency, and community partners, explore the possibilities of creating a new high school and college student program for internships and volunteer opportunities to build future leadership for marine conservation; assess, enhance, and continue volunteer program for the general public, which supports sanctuary education programming.

Living Cultural Traditions Action Plan (CT)



Ali'i loko i'a is a centuries-old, traditional Hawaiian fishpond on the island of Moloka'i. The watch house (kia'i) sits on the fishpond wall (kuapā) near one of the gates (makahā or "eye that breathes") through which small fish can easily enter to find refuge. Photo: Noelani Lee

Desired Outcome

Hawaiian cultural perspective and teachings are incorporated into, or inform and improve, sanctuary programs.

Overview

Diverse cultural perspectives give resource managers and educators different ways to approach and solve problems. Different ways of observing ecological relationships can provide the sanctuary with important tools necessary for wise resource management.

To date, the sanctuary has incorporated some Hawaiian language, stories, and traditions into some of its education and outreach signage, especially at Kaua'i Ocean Discovery. The sanctuary wants to increase the cultural understanding of sanctuary staff and volunteers, and improve and expand its incorporation of place-based cultural perspective and knowledge into sanctuary programs.

The Kumulipo is the framework for the Living Cultural Traditions Action Plan. This ancient story (traditionally chanted) provides pre-historical, place-based knowledge that is essential to provide context for what is happening today. It is foundational to the Hawaiian world view. Among other things, the Kumulipo highlights the Hawaiian perspective on relationships between dozens of marine, freshwater, and terrestrial plants and animals. Sanctuary managers understand that it is important to honor this story of Hawaiian knowledge, perspective, genealogical connections and practices, and, where appropriate, reflect this in sanctuary programs.

Objective CT 1: Better understand traditional and current Hawaiian cultural perspectives and place-based knowledge.

Strategy

Increased familiarity and foundational understanding of Hawaiian culture and perspectives, by sanctuary staff, volunteers, and SAC members, using the Kumulipo as a framework.

Activities

- **CT 1.1: Kumulipo**
Work with existing or new cultural partners to provide an opportunity for sanctuary staff, volunteers, and SAC members to learn about and understand the importance of and deep perspective of the Kumulipo. The Kumulipo provides the cultural framework and foundation for activities 1.2 – 1.5.
- **CT 1.2: Place-based mo‘olelo (stories/legends/history), oli (chants), mele (songs), hula (dances), and/or inoa (names)**
Work with existing or new cultural partners to study place-based mo‘olelo, oli, mele, hula, and/or inoa that teach historical and present-day ecological knowledge of place, especially concerning the koholā and its habitat.
- **CT 1.3: Language**
Work with existing or new cultural partners to provide Hawaiian language (‘ōlelo Hawai‘i) learning opportunities for sanctuary staff and volunteers to enhance cultural understanding and a frame of reference for Hawaiian cultural values and perspective.
- **CT 1.4: Traditional skills**
Work with existing or new cultural partners to provide learning opportunities for sanctuary staff and volunteers to learn traditional Hawaiian skills (for example: the preparation of traditional foods or fish nets).

Objective CT 2: Incorporate traditional and current Hawaiian cultural perspectives, based on or including the Kumulipo, into sanctuary programs, as appropriate.

Strategy

Increased incorporation of the Kumulipo and Hawaiian traditional and current Hawaiian cultural perspectives and/or place-based knowledge into sanctuary programs, materials and outreach information, as appropriate.

Activities

- **CT 2.1: Education and outreach: Kumulipo**
Work with existing and new cultural partners to expand ways to tell the story of the Kumulipo to appropriately enhance the sanctuary education and outreach program (for example: educator workshops, visitor center displays, program materials, and public lectures).

- CT 2.2: Education and outreach: broader cultural aspects**
 Work with existing and new cultural partners to design ways to incorporate more aspects of Hawaiian culture (e.g., ‘ōlelo Hawai‘i, mo‘olelo) in the sanctuary education and outreach program (for example: school programs, visitor center displays, program materials, and signage).
- CT 2.3: Research and monitoring**
 Work with existing and new cultural partners to design ways to incorporate Hawaiian cultural perspectives and place-based knowledge into the sanctuary’s research and monitoring program; for example: designing new research internship projects, working with community volunteers, and communicating science to the public.
- CT 2.4: Administration and management**
 Work with existing and new cultural partners to design ways to incorporate Hawaiian cultural perspectives and value systems into administration and management of the sanctuary.
- CT 2.5: Protect sensitive information**
 Gather input from the SAC and other sources to inform best management practices (BMP) for the use of sensitive knowledge about traditional practices and places. Identify and incorporate existing protocols for protecting sensitive cultural information into sanctuary management practices, including Section 304 of the National Historic Preservation Act and other relevant regulations and guidelines.

Management Effectiveness Action Plan (ME)



Hawaiian Islands Humpback Whale National Marine Sanctuary operates the R/V *Koholā*, a 38-foot rigid hull inflatable boat specifically designed for large whale research and entanglement response. Photo: Jason Moore/NOAA, under NOAA Permit #15240

Desired Outcome

Effective and well-planned operations, human resources and adequate physical infrastructure to support effective management of the sanctuary.

Overview

Managing HIHWNMS requires a strong operational foundation. Highly trained and experienced staff conduct research and monitoring on humpback whales and marine habitat; lead a regional whale entanglement network; and design and conduct education, outreach, and

citizen/community science programs for thousands of teachers, students, visitors, and the general public annually. In addition, the appropriate physical infrastructure must be in place to support operations. The sanctuary has offices and facilities in two locations: Līhu‘e on Kaua‘i and Kīhei on Maui. Both offices have education centers. The Kīhei facility has a large public meeting room, research facilities, and storage. The sanctuary research vessel and other small watercraft are also located in Kīhei.

The Management Effectiveness Action Plan presents activities designed to ensure the required staffing and training, facilities, vessels, safety, and security are in order to support management priorities. In order to maximize resources, NOAA and the state of Hawai‘i will continue to coordinate and collaborate, utilizing existing infrastructure within each organization to facilitate effective operations.

Objective ME 1: Attract, support, and retain highly skilled staff and volunteers to implement the activities of this management plan.

Strategy

Recruit and support well-trained federal, state, and contracted staff whose skills and knowledge remain current and relevant to the needs of effective sanctuary management.

Activities

- **ME 1.1: Staffing plan**
Develop and implement a staffing plan to support and maintain highly skilled federal, state, and contracted staff to implement and meet the goals and objectives of the management plan.
- **ME 1.2: Training for staff**
Improve training and team-building opportunities for federal, state, and contracted staff, prioritizing those skills and information/knowledge needs that will best support successful implementation of sanctuary initiatives and programs. This includes sharing training resources, where applicable, with DLNR, and Objective CT 1: training and learning opportunities that expand and deepen understanding of Hawaiian culture.
- **ME 1.3: Volunteer program**
Continue to improve the sanctuary volunteer program with a focus on recruitment, training, retention, and providing satisfying and meaningful volunteer experiences.

Objective ME 2: Provide ample administrative and budgetary support to ensure effective management of the sanctuary.

Strategy

Have adequate fiscal and administrative resources to implement activities outlined in this plan.

Activities

- **ME 2.1: Annual operating plan**
Produce an annual operating plan that reflects sanctuary activities for the fiscal year based on this management plan, the budget provided by NOAA, and the non-financial resources provided by NOAA, the state of Hawai‘i, and other sources.
- **ME 2.2: Administration**
Oversee fiscal administration and use contracts, MOAs, grants, acquisitions and administrative functions using federal and state guidelines, as appropriate, to implement this sanctuary management plan.
- **ME 2.3: Co-Management**
Implement the Sanctuary Co-Management MOA, which outlines the relationship between the ONMS and DLNR, as well as the working relationship between the federal sanctuary superintendent and the state sanctuary co-manager. Annually review the MOA and adjust as necessary.
- **ME 2.4: External funding**
Continue to support and pursue new external funding opportunities to supplement the budget provided by NOAA, including, but not limited to, grants, collaborations with partner agencies and organizations, and/or donations.
- **ME 2.5: Evaluate management plan**
Assess progress towards implementation of priority programs and meeting the goals and objectives of this sanctuary management plan.

Objective ME 3: Assess, evaluate, and maintain facilities to meet sanctuary standards and support staff needs to successfully implement program activities.

Strategy

Update the planning framework for facility needs along with a streamlined process to ensure maintenance of sanctuary facilities and vehicles. Employ diverse strategies to decrease the environmental impacts of sanctuary operations.

Activities

- **ME 3.1: Facilities master plan**
Update the [Facilities Master Plan](#) for the ONMS Pacific Region to reflect current sanctuary facilities in Kīhei, Maui and Līhu‘e, Kaua‘i, and the needs assessments and planning efforts for other locations.
- **ME 3.2: Maintenance plan**
Maintain a schedule and costs for regular building and grounds maintenance for all facilities, especially the NOAA-owned facilities in Kīhei, Maui. Incorporate this into annual operating plans to address maintenance issues in a timely manner and avoid deferred maintenance that could increase future repair costs.

- **ME 3.3: Assess facility infrastructure**
Assess existing sanctuary facilities annually to ensure adequate and safe infrastructure for staff and visitors.
- **ME 3.4: Restore fishpond**
Continue to partner with Maui Fishpond Association (‘Ao‘ao O Na Loko I‘a O Maui) to assist their restoration of the culturally significant Hawaiian fishpond in front of the Kīhei facilities, which also serves as a natural buffer to reduce site flooding and coastal erosion.
- **ME 3.5: Landscaping**
Grow native and Hawaiian ethnobotanical plants in the landscape to minimize water usage, provide shading and act as a natural filtration system; work with cultural and science partners to communicate cultural and conservation value to visitors.
- **ME 3.6: Energy conservation**
Implement green building technologies in renovations where possible to increase energy conservation.

Objective ME 4: Maintain safe and operational vessels that can meet the research and response requirements of the sanctuary.

Strategy

Ensure that all sanctuary small boats are operational, and boat crews trained and readily available for sanctuary activities.

Activities

- **ME 4.1: Train vessel crew**
Maintain regular training and certifications for vessel operators and crewmembers in accordance with the NOAA and ONMS Small Boat Program including all safety training.
- **ME 4.2: Small boat operation**
Acquire, maintain, repair, and modify small boats in accordance with NOAA and ONMS Small Boat Program guidelines and support the operational requirements, personnel, and maintenance needs for each vessel.
- **ME 4.3: Small boat infrastructure**
Maintain the infrastructure to adequately support the operation of small boats, including routine maintenance, vessel improvements, storage facilities, pier space, and trailers and trucks for towing.



Individual humpback whales can be identified by the color patterns and shape of their fluke, or tail. Photo: Ed Lyman/NOAA, under NOAA Permit #774-1714

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APPENDIX A: NEPA DETERMINATION

NOAA Administrative Order (NAO) 216–6A and the NOAA NEPA Companion Manual for NAO 216-6A (<https://www.nepa.noaa.gov/docs/NOAA-NAO-216-6A-Companion-Manual-01132017.pdf>) establish NOAA’s policy and procedures for compliance with the National Environmental Policy Act (NEPA) and the associated Council on Environmental Quality’s (CEQ) regulations. NEPA, the CEQ regulations, NAO 216-6A, and NOAA’s NEPA Companion Manual require all of NOAA’s proposed actions to be reviewed with respect to environmental consequences on the human environment.

In a draft environmental impact statement (EIS) and a proposed rule (80 FR 16224) dated March 26, 2015, NOAA proposed to amend the sanctuary regulations, revise the terms of designation, and revise the management plan. After receiving public comment and holding a series of public meetings, NOAA decided to withdraw the proposal to amend the regulations and revise the terms of designation but to continue with revising the 2002 management plan (81 FR 13303, dated March 14, 2016).

As a result of the revised scope of the proposed action, NOAA determined that preparation of a final EIS or environmental assessment was not necessary for finalizing this revised management plan. NOAA determined that because this final management plan does not include changes to the sanctuary boundary or regulations, it is an administrative action that includes only minor substantive changes to the existing 2002 sanctuary management plan that would not have significant impacts on the environment. Therefore, this action meets the definition in Appendix E of the NOAA NEPA Companion Manual under categorical exclusion (CE) reference number A4 – “Minor updates to existing national marine sanctuary management plans. This CE does not apply to sanctuary designations, expansions, changes in terms of designation, or new sanctuary management plans.” In considering the list of extraordinary circumstances, NOAA determined that none would be triggered by this revised management plan. Therefore, NOAA determined that this final management plan would not result in significant effects to the human environment and is categorically excluded from the need for further review under NEPA.

NOAA prepared this NEPA determination using the 1978 CEQ NEPA Regulations. NEPA reviews initiated prior to the effective date of the revised CEQ regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020. The review of this action under NEPA began on July 14, 2010 when NOAA published a Federal Notice initiating the review of the sanctuary management plan. Therefore, NOAA decided to proceed under the 1978 regulations.

APPENDIX B: MAPS

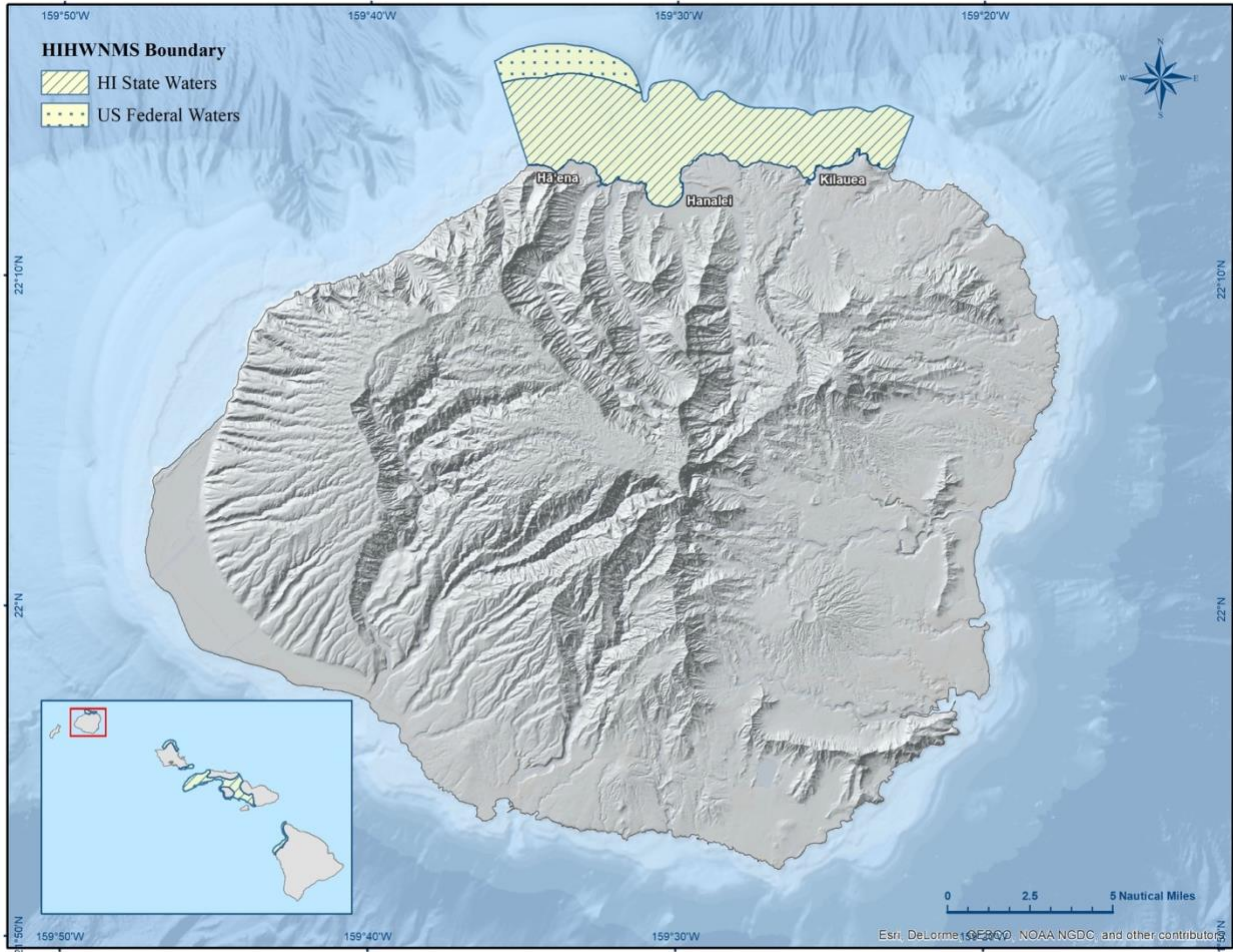


Figure B1. Sanctuary boundaries off the island of Kaua'i, showing federal and state waters. Image: HCRI/NOAA

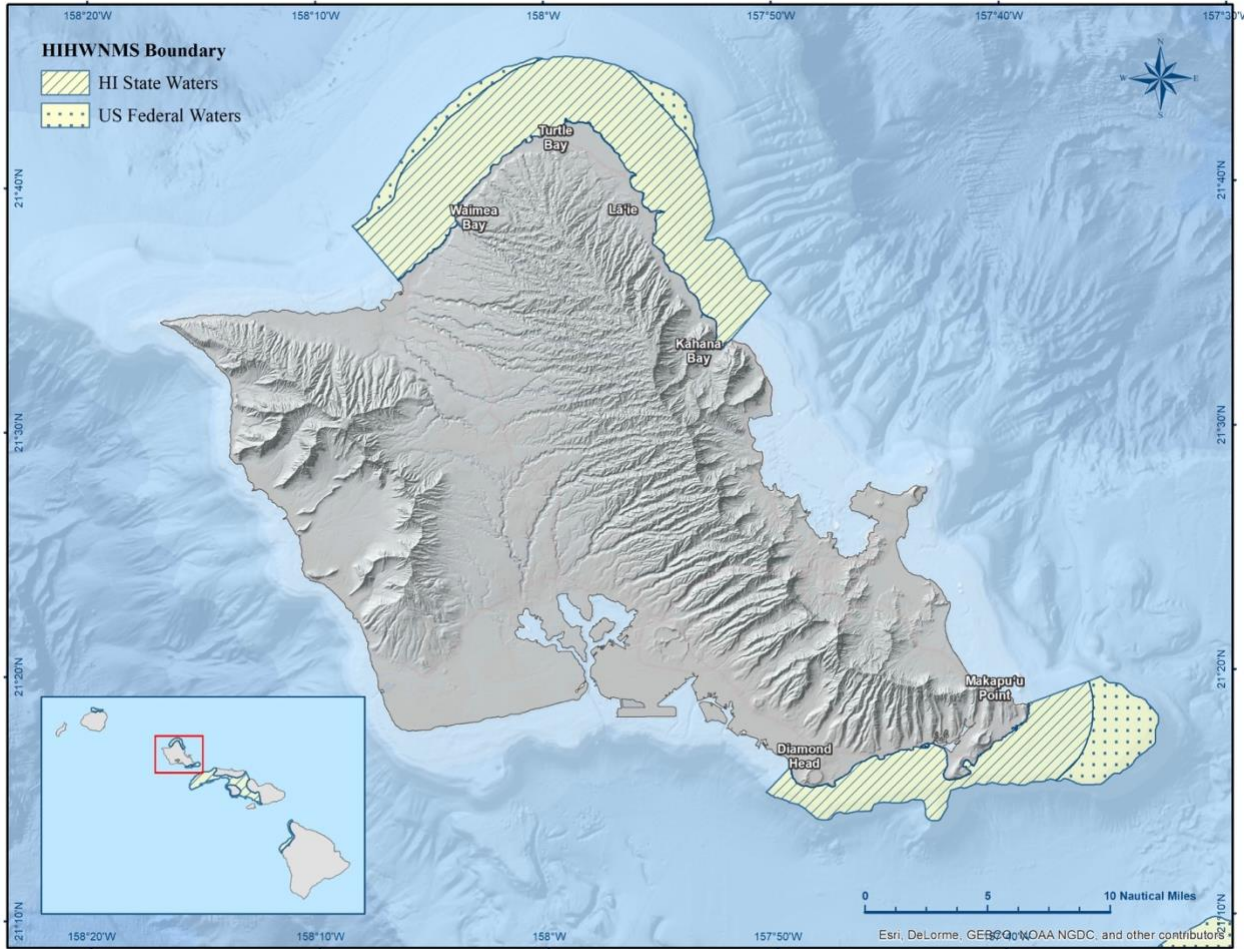


Figure B2. Sanctuary boundaries off the island of O'ahu, showing federal and state waters. Image: HCRI/NOAA

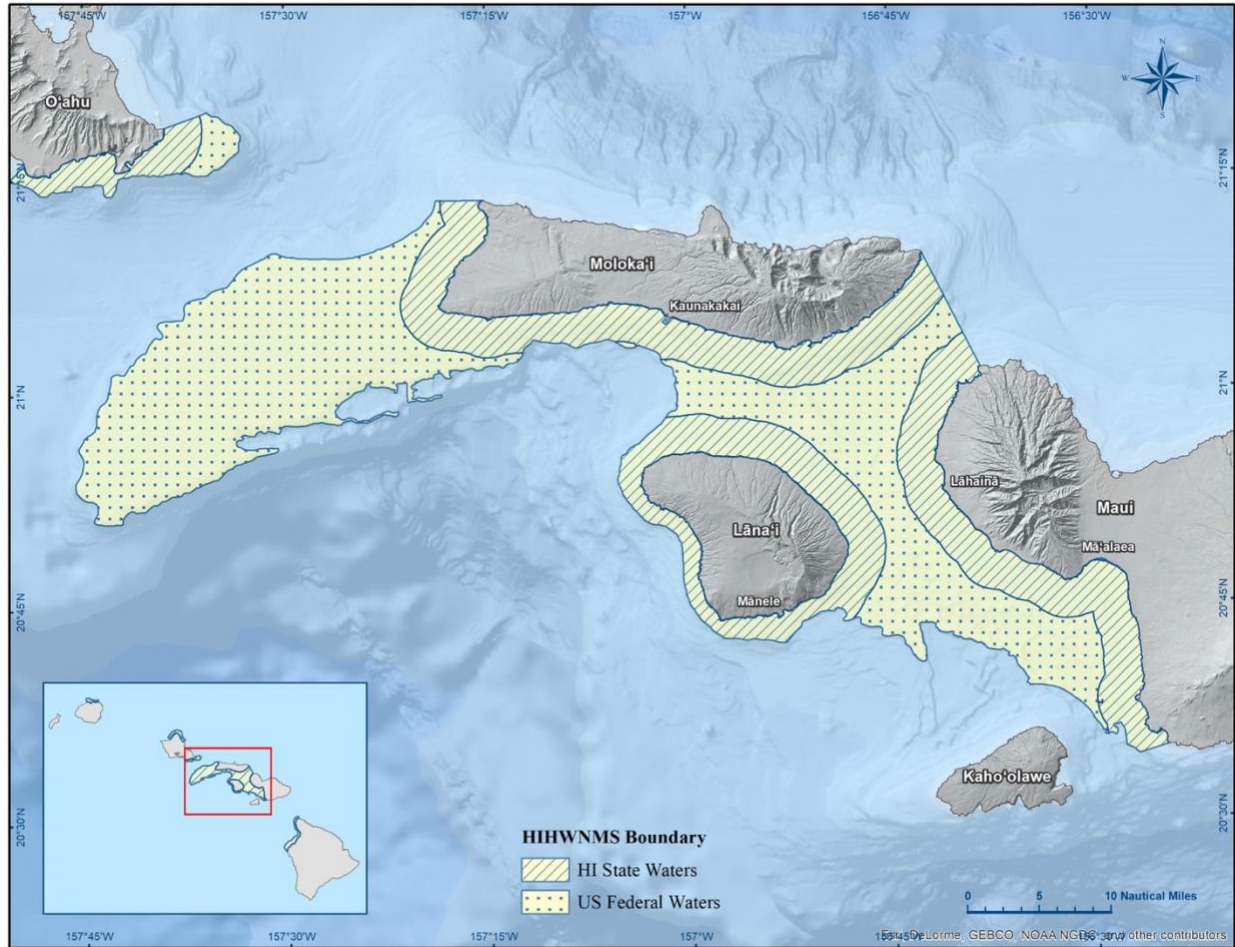


Figure B3. Sanctuary boundaries off the islands of (clockwise) Moloka'i, Maui, and Lāna'i, showing federal and state waters. Image: HCRI/NOAA



Figure B4. Detail of sanctuary boundaries outside (clockwise) Hale o Lono and Kaunakakai harbors on the island of Molokai and Mānele and Kaunalapau harbors on the island of Lāna'i. Image: HCRI/NOAA

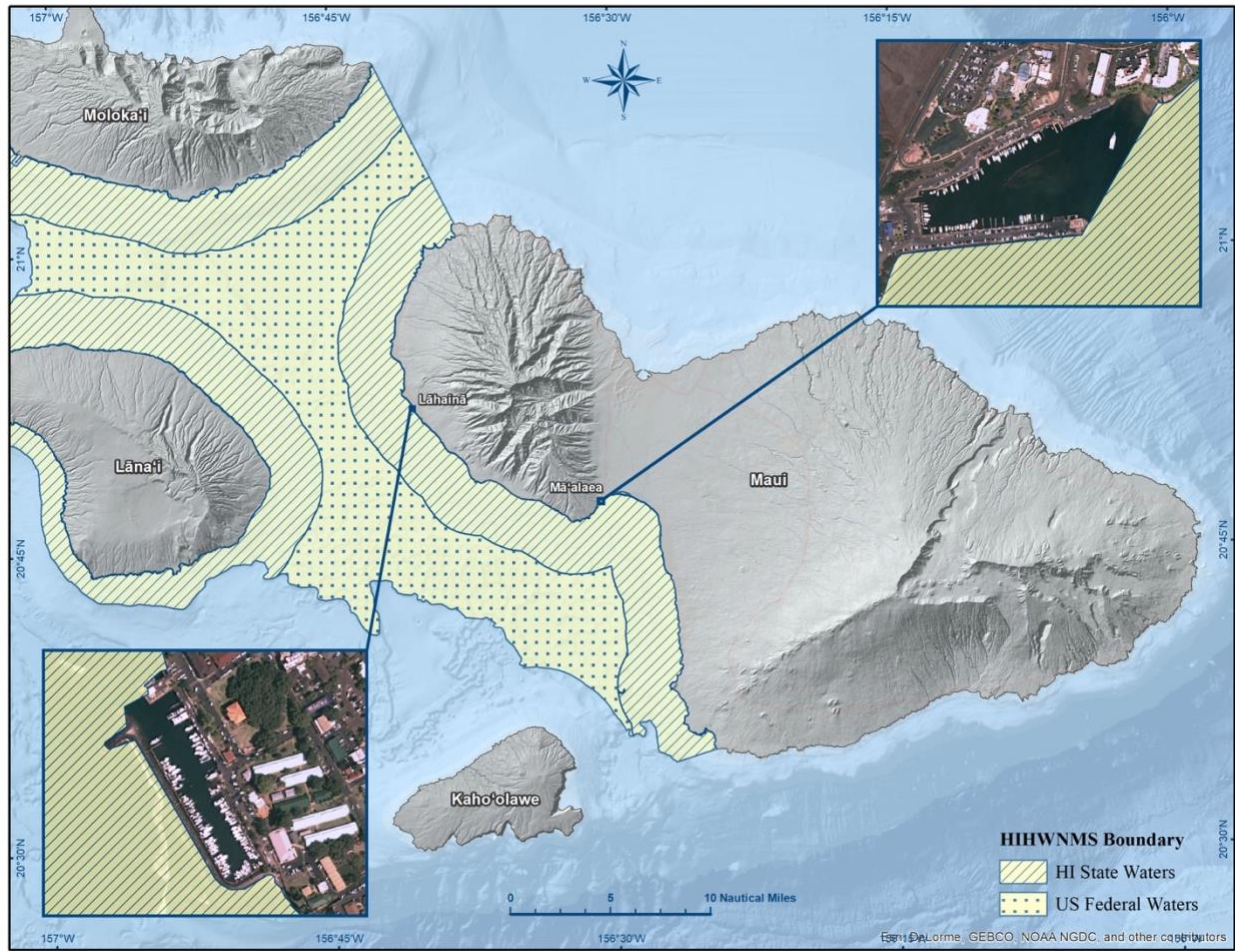


Figure B5. Figure A5: Detail of sanctuary boundaries outside (left to right) Lahaina and Mā'alaea harbors on Maui. Image: HCRI/NOAA

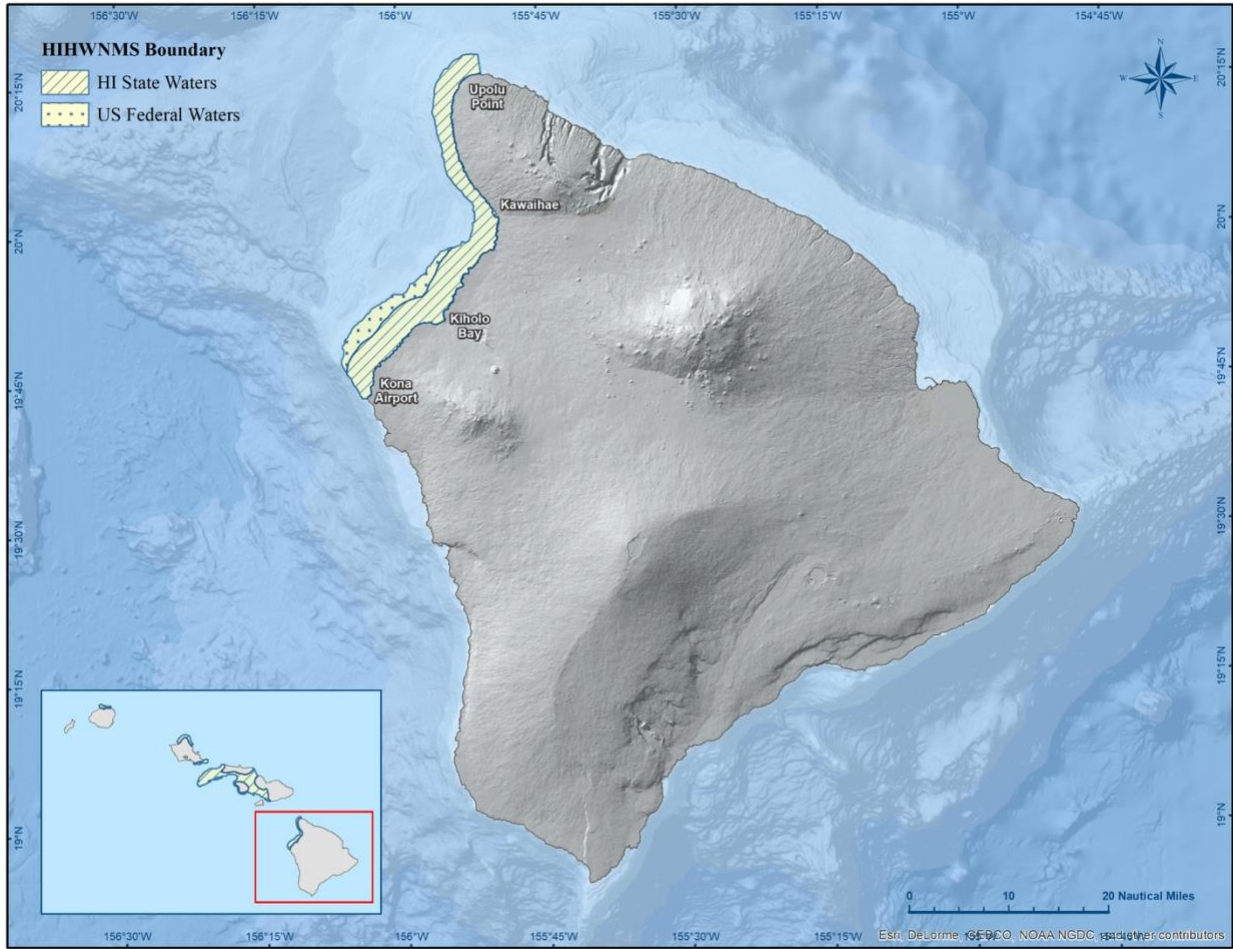


Figure B6. Sanctuary boundaries off the island of Hawai'i, showing federal and state waters. Image: HCRI/NOAA

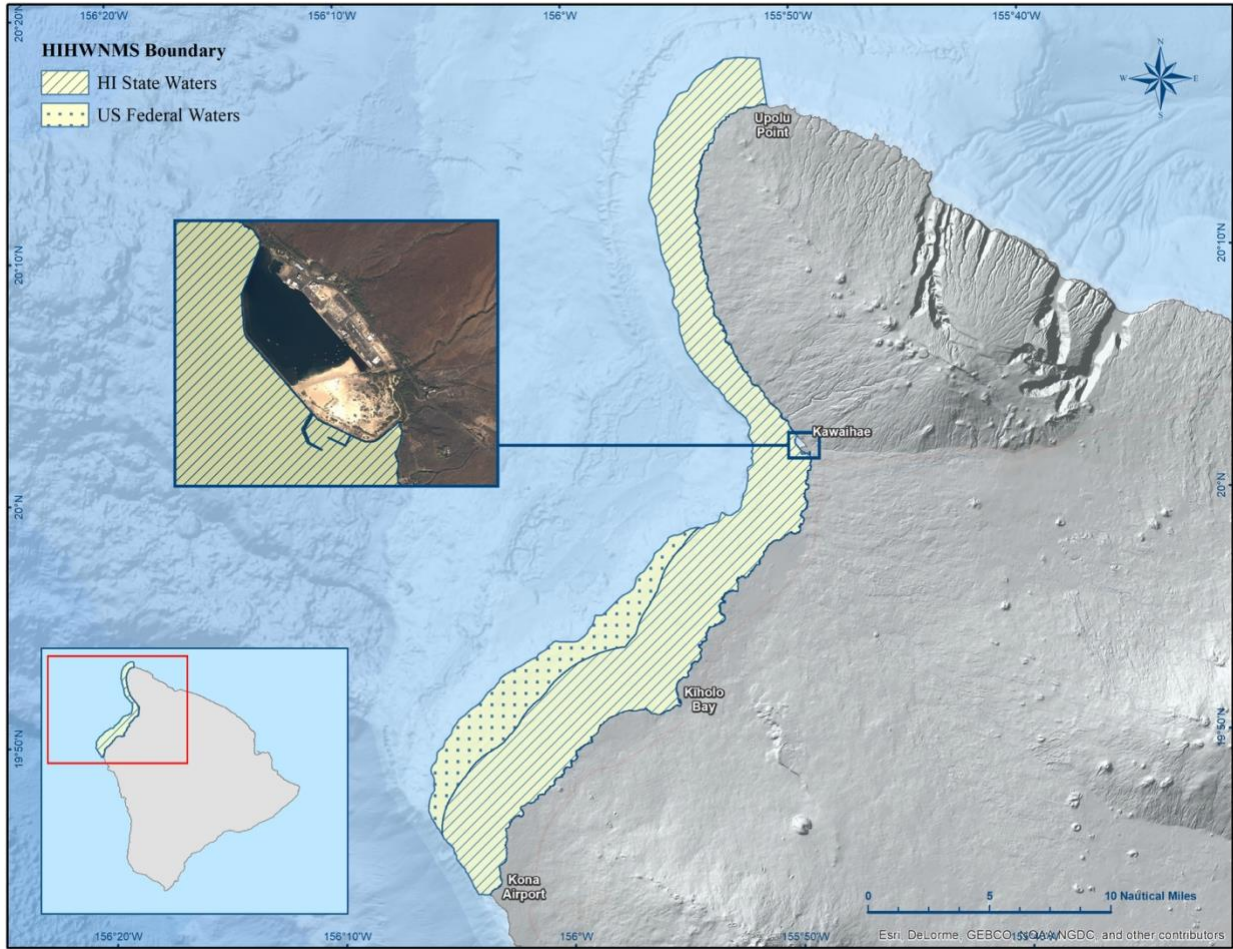


Figure B7. Detail of sanctuary boundaries outside of Kawaihae harbor on the island of Hawai'i. Image: HCRI/NOAA



AMERICA'S UNDERWATER TREASURES

<http://sanctuaries.noaa.gov>