HAWAIIAN ISLANDS HUMPBACK WHALE

NATIONAL MARINE SANCTUARIES

STATE OF THE SANCTUARY REPORT

NOAA ocean SERVICE

NATIONAL MARINE SANCTUARIES ™

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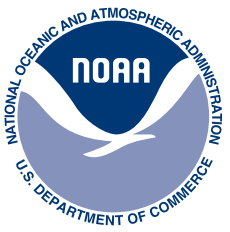

The National Marine Sanctuary Program

The National Marine Sanctuary Program, a network of 13 marine protected areas, encompasses ocean and freshwater resources from Washington state to the Florida Keys, from Lake Huron to the Gulf of Mexico and from offshore to the island of American Sāmoa. The National Oceanic and Atmospheric Administration's National Ocean Service has managed the national marine sanctuaries since the passage of the Marine Protection, Research, and Sanctuaries Act of 1972. Title III of that Act is called the National Marine Sanctuaries Act.

Today, our marine sanctuaries contain deep ocean gardens, coastal coral reefs, whale migration corridors, deep-sea canyons, and underwater archaeological sites. They range in size from one-quarter square mile in Fagatele Bay, American Sāmoa, to more than 5,300 square miles off Monterey Bay, California, one of the largest marine protected areas in the world. Combined these sanctuaries protect nearly 18,000 square miles of coastal and open ocean waters and habitats within a multiple use framework. Multiple uses such as recreation, commercial fishing, and shipping are permitted to the extent that they are consistent with an individual sanctuary's resource protection mandates. Research, education, and outreach activities are also included in each sanctuary's program of resource protection.

The National Marine Sanctuary Program, as a leader in marine protection, is committed to effective ocean management with special emphasis on the protection of our nation's living marine resources and submerged cultural resources.

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Front Cover: The average tail of the adult humpback spans nearly 30 feet. Its powerful muscles enable humpbacks to migrate 3,000 miles between polar seas and Hawaiian waters.
Photographer: ©Doug Perrine/Seapics.com/NMFS permit # 633

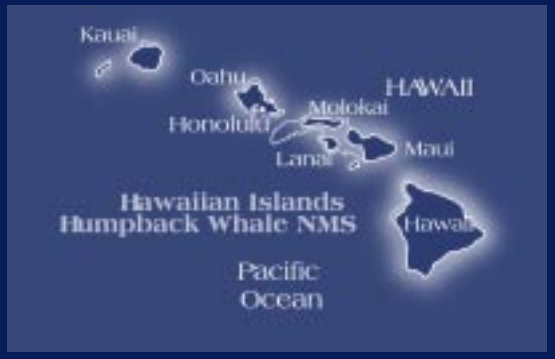
Back Cover: Hawaiian waters are believed to be the birthplace of most humpbacks in the North Pacific.
Photographer: ©Doug Perrine/Seapics.com/ NMFS permit # 822

The Hawaiian Islands Humpback Whale National Marine Sanctuary

The warm and shallow waters surrounding the main Hawaiian Islands constitute one of the world's most important humpback whale habitats. Scientists estimate that two-thirds of the entire North Pacific humpback whale population migrate to Hawaiian waters each winter to breed, calve, and nurse their young. The continued protection of humpback whales and their habitat is crucial to the long-term recovery of the endangered species. The Sanctuary is also home to pilot whales, Hawaiian monk seals, spinner dolphins, green sea turtles, trigger fish and cauliflower corals. Its waters also include archaeological sites and historic shipwrecks.

The sanctuary is managed through a partnership between the State of Hawai'i and the National Oceanic Atmospheric and Administration (NOAA) which strives to cultivate and heighten awareness by developing programs in marine research and education.

The Hawaiian Islands Humpback Whale National Marine Sanctuary invests vigorous efforts in ensuring participation in ocean education and the support of accessible marine research through programs that highlight the humpback whales and the special Hawaiian ocean environment.



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Humpback mothers care for their newborns in sanctuary waters. Photographer: ©Doug Perrine/Seapics.com/ NMFS permit # 633

Concern for the future of endangered humpback whales in Hawaii have prompted popular support for protection of the species.
Photographer: ©Doug Perrine/Seapics.com/NMFS permit # 633

Introduction

Executive Summary

The whales are coming! The whales are here! Excitement always greets the arrival of humpback whales in Hawai‘i. Sightings of the colossal creatures begin in November and reach full crescendo by February. Throughout the winter season, thousands of humpbacks are in Hawaiian waters to mate and give birth. Their size and their acrobatic behavior makes them easy to spot. They hurl themselves into the air and crash back down with thunderous splashes. Their long, distinctive flippers prompted scientists to identify the humpback species as *Megaptera novaeangliae*, or “great wings of New England.”

By summer, the huge marine visitors have disappeared from the Hawaiian horizon, travelling nearly 4,000 miles to the nutrient-rich arctic region of the North Pacific Ocean where they spend several months foraging for food. The humpbacks live off their energy reserves during winter before returning once again to renew their life cycle in Hawai‘i’s warm, tropical waters.

This marvelous wonder is the focus of the Hawaiian Islands Humpback Whale National Marine Sanctuary, which Congress created in 1997 to protect the whales and ensure the health and safety of critical humpback breeding habitat in Hawaiian waters. Although humpbacks were once plentiful in oceans worldwide, the global population of *Megaptera novaeangliae* was depleted by the commercial whaling industry at the start of the 20th century. In 1973, the United States government made it illegal to hunt, harm, or even disturb humpback whales. Because of their perilous brush with near-extinction, the animals were officially listed as endangered and remain so to this day. While many subsequent laws and policies have been added to reduce human threats to humpbacks, the sanctuary is unique in its mission of helping the public and government work together to ensure that an endangered species’ breeding habitat will become a lasting haven. Through a partnership between the Hawai‘i Department of Land and Natural Resources (DLNR) and the National Oceanic and Atmospheric Administration (NOAA), the sanctuary uses education and research to convey the significance of the humpback whale to the culture, economy and environment of Hawai‘i. The sanctuary’s guiding principle is the belief that from knowledge and understanding comes a heightened appreciation for natural marine resources and a commitment to collective stewardship.

Putting this principle into practice in Hawai‘i requires that the sanctuary address unique

circumstances. The waters surrounding Hawai'i have an embracing presence. Their health impact everything from climate to personal well-being among both residents and visitors. However, as the human population grows and use of the ocean expands, so does the potential for increased threats to Hawaiian waters and the animals that make it their home. Hawai'i's marine sanctuary seeks to strike a balance and minimize conflicts between stakeholders. In order to find that balance, the sanctuary is interested in gathering public comment to help develop policies and direct a course of action that serves the public interest.

As the sanctuary celebrates its fifth anniversary, the sanctuary is proud to report that it is fulfilling its mission of resource protection. Much of the credit for the sanctuary's initial phase of growth belongs to the Sanctuary Advisory Council, the sanctuary volunteer organization comprised of local appointed community representatives, and the interagency and organizational partnerships. Their dynamic and comprehensive assistance has enabled the sanctuary to establish a presence and expand its scope of programs as mandated by the National Marine Sanctuary Program.

Sanctuary-funded research projects have greatly enhanced the scientific understanding of the biology and behavior of humpback whales. Population and distribution studies—also conducted with sanctuary support—show that Hawai'i's migratory population is increasing at an annual rate of 7 percent. Although threats to humpback whales continue to exist, the sanctuary has taken a lead role in identifying these threats. As sponsor of the 2000 Hawai'i International Marine Debris Conference, the sanctuary supported the development of innovative solutions to problems resulting from discarded and lost fishing gear, which endanger whales and other marine creatures.

The sanctuary is a leader in providing the public and policymakers with new and updated information on humpback whales. The Sanctuary's Education Center at its headquarters on Maui has developed monthly lectures and teacher-student workshops; these events have garnered outstanding recognition and attendance. The headquarters' spectacular beachfront setting provides opportunities for shore-based whalewatching that are complemented with signage and pamphlets providing cultural and scientific interpretation of the humpback species and other natural resources found within a locale that truly ranks as a "living classroom." Sanctuary volunteers have contributed substantively to the on-site educational activities. The comprehensive training program instills in volunteers an understanding of sanctuary goals and has distinguished a network of individuals for their dedication to environmental stewardship.

Through regular participation in ocean fairs and public events, the sanctuary has raised its public profile, and, in only a few years, has become a recognized authority in the field of marine resource

The rich variety of marine life in Hawaiian waters includes the false killer whale *(Psueudorca crassidens)*.
Photographer: ©Doug Perrine/Seapics.com

New research shows humpbacks are not always "gentle giants, as is often assumed. During mating season, males compete aggressively against each other. Photographer: ©Doug Perrine/Seapics.com

Humpback's huge wing span visible during breaching. Photographer: ©Doug Perrine/Seapics.com/ NMFS permit # 822

management. Through sponsorship of two signature events, the Kaua'i Family Ocean Fair and the Sanctuary Ocean Count, the sanctuary invites widespread public participation. It has also fostered appreciation for the most innovative frontiers of marine science by hosting the 2000 Sustainable Seas Expeditions in Hawai'i, which introduced local citizens and researchers to NOAA-supported pioneers of underwater exploration.

The sanctuary has taken remarkable steps to integrate support for Native Hawaiian uses of the environment into its general educational program. Many aspects of traditional Hawaiian stewardship are the focus of sanctuary educational activities. The sanctuary's research on the ancient Hawaiian perspective on whales is unique and has been summarized extensively in a sanctuary pamphlet that ranks as the only published work devoted entirely to the *kohola*̄, as the humpback whale is known in the Hawaiian language.

The sanctuary cooperates extensively with enforcement agencies in supporting regulations aimed at protecting humpback whales. The effort has been expanded to include an annual workshop on laws regulating interaction between humans and marine creatures in Hawaiian waters. Through partnerships with enforcement authorities, the sanctuary has increased the likelihood of public compliance with laws intended to reduce harm to humpback whales.

While humpbacks are slowly recovering and their population in Hawaiian waters expanding, so too, is interest in humpbacks on the rise. The sanctuary has provided guidance for the burgeoning whalewatch industry. It also conducted a study to document the industry's economic contribution to Hawai'i. The sanctuary has encouraged the business community to explore ways of capitalizing on the presence of humpback whales while also using this enterprise as a springboard for public education and information on humpback whales.

What the State of the Sanctuary Report Means to You

In this State of the Sanctuary Report, you will find an overview of activities, programs, and projects as well as marine resources and management issues pertinent to the sanctuary's development in the last five years. The information is intended to help you assess how the sanctuary has served you and your community. This report will also enable you to help chart the sanctuary's future course of action. If after reading this report, you would like to express your support or recommend any changes, you will have

the opportunity to do so shortly, when a revised sanctuary management plan is made available for public review.

Federal law requires all national marine sanctuaries to have a management plan that sets regulations and guides program and policy development. It also requires regular public review of the management plan so that the sanctuary can be dynamic and responsive to emerging trends and community interests. Significant scientific discoveries and new issues often make it imperative to change the way we protect marine resources and practice stewardship. By inviting public comment in our management plan review, we ensure opportunities for your concerns and recommendations to be considered and possibly incorporated into the revised management plan.

Through the work of staff and the Sanctuary Advisory Council, a draft of a revised management plan has been completed for your review in a series of public meetings that will be held in 2002. Your participation is vital because it will enable the sanctuary to better address needs and activities of Hawai'i's ocean-using community. This will ultimately benefit the conservation and enhancement of Hawai'i's marine resources.

Read through these pages and get to know the sanctuary's past so that you can help chart the most effective course for its future. The State of the Sanctuary Report is your primary assessment tool. Your comments on what is working or what is not will be solicited at the public meetings. Sanctuary partners DLNR and NOAA will consult on finalizing the revised management plan. Their joint approval is necessary for the sanctuary to continue operating.

The time and place of public meetings will be advertised in the local media and on the sanctuary web page. Please contact your local sanctuary office if have any questions. Your interest in and support of the meetings will help build a sanctuary that is not only a haven for humpbacks but also an asset to the health of Hawai'i's future.

Note to reader: For the sake of clarity, this report uses specific wording to identify the sanctuary as a vehicle for collective wildlife protection. The term "our sanctuary" or the pronoun "we" are used to identify projects and activities involving sanctuary staff as well as Sanctuary Advisory Council representatives, sanctuary volunteers, and participation by the ocean-using public.

Sunset over whale habitat. Photographer: ©Doug Perrine/ Seapics.com

Hawaiian coastal waters, like those seen here on Makapu'u off the coast of O'ahu, are famed for their beauty and economic value.
Photographer: HIHW Staff

In the Hawaiian breeding ground, a pod often consists of several males vying for the attention of the same female. Photographer: ©Doug Perrine/ Seapics.com/NMFS Permit # 633

Purpose

National marine sanctuaries are special places that have been established for their natural and/or cultural significance. The Hawaiian Islands Humpback Whale National Marine Sanctuary was designated for the primary purpose of protecting humpback whales and their habitat within the Hawaiian Islands marine environment.

Designation

The Hawaiian Islands Humpback Whale National Marine Sanctuary was created by Congress in November 4, 1992 through the Hawaiian Islands National Marine Sanctuary Act (HINMSA). The final regulations were published in the *Federal Register* (62 FR 14799) on March 28, 1997. The regulations and the final management plan took effect on June 2, 1997.

Regional Context

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 migrate to Hawai'i each winter. Here, they breed, calve, and nurse—activities critical to the survival of their species.

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

Sanctuary Uses

People use Sanctuary resources in a variety of ways. Native Hawaiians have long had a close relationships with their marine environment. Nowadays, the marine area included in the Sanctuary is used extensively for ocean recreation, commercial fishing, cruise ships and commercial shipping.

The Sanctuary and Education

A Hawaiian elder shares an old Polynesian legend about a mythological whale. A visitor takes time out from the beach to attend a lecture by a marine mammal scientist. A boat captain throttles down and proceeds with caution into an area where mother humpbacks are known to nurse their newborns.

These are snapshots of the education we provide as a sanctuary. As part of an overall effort to generate responsible stewardship and ocean literacy, the sanctuary provides the necessary natural, cultural, and historic information on humpback whales. Through our education programs, we help convey information and expand knowledge on the endangered whale species. We believe that knowledge leads to care of the environment, which translates into positive action and decision-making.

Our sanctuary is a rich marine environment, a stimulating and easily accessible place for experiential lessons in natural resources. This natural classroom complements many Hawai'i institutions that enjoy worldwide recognition in ocean education. Additionally, employment and enterprise in ocean-related fields is growing, creating opportunities in such diverse fields as aquaculture, geophysics, and ocean recreation. The sanctuary has capitalized on its role as a public agency to encourage the community to care for and appreciate the humpback species.

Since its designation in 1992, the sanctuary and representatives of the Sanctuary Advisory Council have worked together, creating products and activities that serve three educational strategies:

1. Increase understanding of the humpback whale species. With Hawai'i at the forefront of humpback research, the sanctuary strives to share new and accurate information with the public. Several fundamental questions about behavior of humpbacks are now being addressed. As more scientific information becomes available, the sanctuary is prepared to revamp its public education programs to include the new information and perspectives.

2. Increase awareness of the National Marine Sanctuary Program. This strategy is aimed at helping the

Humpback whale breaching.
Photographer: ©Doug Perrine/Seapics.com/NMFS permit # 633

Humpback whale hat-making has become has become a favorite craft activity for youngsters at sanctuary outreach events. Photographer: Kellie Cheung

Humpback whales can be seen close to shore in Hawai'i during winter. Photographer: ©Doug Perrine/ Seapics.com/NMFS Permit # 633

Sanctuary's Maui office is housed in a picturesque three-story building, once used as a government weather station during WWII.

public understand the importance of a sanctuary and how certain policies support the agency. An important aspect of this strategy is establishing the connection between sanctuary programs and desirable conservation outcomes.

3. Expand understanding of the relationship between humpback whales and ongoing human activities in the humpback's habitat. In order to define appropriate human behavior towards humpback whales, people need to understand how their actions impact this habitat. In order to do this, the sanctuary works to provide information from traditional native Hawaiian conservation methods to emerging theories on the effects of activities such as underwater sonar experiments.

Maui Education Center

The shorefront headquarters of the Maui sanctuary serves a scenic magnet for visitors from around the world. The attractive setting is enhanced by signage, a garden of native Hawaiian plants, and a viewing deck and view scopes that facilitate shoreline observation of humpbacks during the winter season.

These efforts are a cost-effective way of reaching residents and visitors and drawing attention to the astounding beauty of the coastal resources. Training has enabled sanctuary volunteers and on-site staff to provide scientific explanations of humpback whale behavior quashing the notion that humpbacks are "playful gentle giants." Now they explain the humpback's mammalian

traits and breeding habits, which appear to be the real explanation of the animal's mesmerizing acrobatic displays.

Staff and volunteers worked together to design and develop the Sanctuary's Education Center which opened to the public in 1998 on the grounds of the sanctuary headquarters. The center features displays, videos, brochures, and books on the humpback whale, methods of modern resource management and Hawaiian stewardship, and latest humpback research. A free public lecture series is held monthly to present cultural and scientific perspectives on the humpback whales and marine research. Nearly 50 volunteers have undergone training; They manage the center and serve as informal docents. School groups are encouraged to take field trips to the headquarters. Sanctuary staff has developed an on-site interpretive curriculum with information on whales, stewardship, and native Hawaiian cultural resources including a historic beachfront aquaculture pond on the sanctuary grounds. In fiscal year 2001, more than 5,400 people visited the sanctuary headquarters, with the peak in visitor numbers occurring during the winter "whale season."

Providing Marine Education

The sanctuary has not been able to implement comprehensive curricula on humpback whales due to staffing limitations that have hampered statewide activities. However, staff and supporters have created brochures, pamphlets, and other original materials, which they have provided to teachers. At the suggestion of Sanctuary Advisory Council members, who made contact with the State Department of Education and the University of Hawai'i School of Ocean and Earth Science and Technology (SOEST), one of many Hawai'i institutions that fosters student interest in professional ocean research and development. Recent education projects include:

- Sanctuary partnerships with the Hawai'i Department of Education's interactive science television series, *Kidscience*, providing information on humpback whales and appearing on several programs.
- Positions for sanctuary interns who receive college credit and student stipends under the University of Hawai'i's Marine Options Program.
- Sanctuary sponsorship of a "Careers on the Water Day" with Farrington High School. The sanctuary coordinated the participation of marine science experts who advised students on professional opportunities in ocean research, education, and commercial and technical development.

Supporting Major Marine Education Drives

In 2000, the sanctuary coordinated the Hawai'i visit of the Sustainable Seas Expedition (SSE), developed by SSE leader and marine scholar Dr. Sylvia Earle, NOAA, and the National Geographic Society. The five-year project on advanced undersea technology explores marine environments and is aimed at increasing public appreciation of marine sanctuaries. SSE generated a great deal of local interest in the underwater frontier by deploying cutting-edge one-person submersibles and documenting daily discoveries at ocean depths rarely visited by human observers. During her Hawai'i visit, Dr. Earle recorded the presence of at least one *Haliphron atlanticus*, a pelagic octopod, so rare that it has only been seen once before by a human. The sanctuary staff, volunteers, and council members collaborated to maximize opportunities for local students and scientists to participate in activities of the Hawai'i SSE visit, including the gathering and analysis of data on marine ecosystems.

In a move known as "fluking", the humpback raises its tail and dives head-first underwater for intervals that last around 30 minutes.
Photographer: ©Doug Perrine/Seapics.com/NMFS Permit # 822

At the Sanctuary Education Center, teachers discover new curriculum tools for teaching lessons on humpback whales. Photographer: HIHW Staff

Education in Sanctuary Waters

Sanctuary Advisory Council member Patty Miller, who is also a seasoned science teacher, has plenty of stories about the spontaneous combustion of learning that youngsters experience by visiting the sanctuary sites. "They're getting a lesson that's hands-on and it really appeals to children in Hawai'i because most often they already have a love of the ocean. They spend time with their families fishing and swimming at the beach. It's not such a jump to develop interest in marine science. They feel a sense of ownership when it comes to anything ocean-related."

Miller has also been leading the charge in an effort to help the sanctuary expand curriculum on humpbacks and the Hawaiian aquatic environment. "Compared to other physical sciences such as chemistry and biology, marine science is relatively underdeveloped. A sanctuary may not have the necessary resources to take the lead in curriculum development, but we can provide specific tools and encourage educators to use sanctuary sites as a living classroom."

Sanctuary staff members hail the move to promote environmental learning through

In 2000, the sanctuary also hosted the International Marine Debris Conference in Honolulu, which increased public awareness of the mounting problems associated with lost and abandoned plastic fishing gear in the ocean. Nearly 300 marine resource managers, educators, and policymakers attended the conference where they learned about the potentially deadly effects of marine debris on marine mammals and other sea creatures. Non-biodegradable materials can cause strangulation if ingested or fatal entanglement when encountered by an animal. The conference included workshops on legal issues, source identification, impacts, and industry considerations. The sanctuary staff and council also coordinated the participation of 70 students from island nations throughout the Pacific, where the normally pristine marine environment has been heavily impacted under increasing assault of plastic debris.

Public Events

The growing interest in and enjoyment of marine resources by the general public is providing a basis for ocean-themed events, including fairs and festivals. Staff and volunteers have been extremely creative in their efforts to design craft and outreach activities to appeal to diverse audiences. In 1999, a banner year for sanctuary educational activities for the public, staff participated in 58 events that were attended by approximately 213,000 people. In response to the growing interest, the sanctuary has built several permanent displays including a permanent tabletop exhibit of a National Marine Sanctuary Program map. The sanctuary also installed an exhibit on humpback whale biology at the Kaua'i Children's Museum.

The sanctuary organized the Kaua'i Family Ocean Fair, which is co-sponsorsed by the Kīlauea Point National Wildlife Refuge. Last year, the fair attracted more than 3,500 attendees. The Sanctuary Ocean Count, another sanctuary event, last year enlisted the help of more than 1,000 volunteers to conduct the annual census of humpback whales from shoreline locations statewide. Both the Family Ocean Fair and the Ocean Count have received significant coverage in the local and national news media, commending the sanctuary for increasing public participation in ocean education activities annually.

Future Efforts

Our revised management plan, calls for developing a more structured framework for interpreting the

significance of the humpback whale and its habitat. Performance indicators will help us systematically assess the success of initiatives already in place and prioritize our diverse educational and outreach activities. With a diverse plan in place, we will be better able to coordinate among our sanctuary offices and with partnering organizations and agencies. We plan to conduct market research to gauge awareness of the sanctuary and its resource protection programs. This will provide a basic assessment of information gaps and help us focus efforts. We also plan to evaluate the education programs of other sanctuaries to determine whether certain components would be appropriate for Hawai'i.

The Sanctuary and Research

In 1985, the plight of "Humphrey the humpback" drew national attention. The hapless whale had entered San Francisco Bay and then managed to swim fifty miles upstream inside the Sacramento River, languishing there for three weeks—much to the dismay of local residents. Efforts to drive Humphrey back down the river failed. Then researchers from the Kewalo Basin Marine Mammal Laboratory in Hawai'i hatched a rescue plan. They had discovered during earlier studies that a trumpetlike sound recorded from whales in the course of feeding activity in Alaska was highly attractive to many whales in Hawai'i. The huge animals responded to the sound by swimming quickly in its direction. Why not broadcast a recording of the charismatic whale-call to draw Humphrey back towards the ocean?

The plan worked, saved Humphrey's life, and, in the process, demonstrated that research can be applied in the service of whale conservation.

The lesson learned from the Humphrey incident is the same one that underlines the sanctuary's interest in research. The more we know about humpbacks, the better equipped we are to aid them in their struggle for survival. Until recently, most information on the species came from biologists who had examined the carcasses of humpbacks killed by whalers. Features of the whale's anatomy could be learned from this, but little more. In contrast, the study of living humpbacks, sheds light on what humpbacks need, where they go and what they do. By understanding the animal's normal behavior, changes are easier to detect and examine for possible evidence of new threats affecting the species' recovery.

While research on living whales is often costly and involves many logistical and legal challenges (proper government permits are required for close approach to endangered humpbacks), the sanctuary is a strategic locale for obtaining important information on humpbacks. It is, in fact, a veritable environmental experience for people of all ages. At the Maui site, they get direct feedback from the steady stream of visitors who come for the scenery, including the good vantage point on whales, but frequently leave with a lot more, including the resolve to return for a lecture by a whale researcher or a beach cleanup. This all fits in with the plan for a marine sanctuary to deliver meaningful take-home lessons in helping citizens discover their personal connection to valuable ocean resources.

Spectators watch from the shore as nets were cast for the fishing demonstration. Behind the audience stands the Maui Sanctuary office, a volunteer-renovated building that was once home to the National Weather Service.
Photographer: Jeff Alexander

The humpback calf weighs several tons at birth and grows very quickly by feeding on about 50 gallons a day of mother's milk.
Photographer: ©Doug Perrine/Seapics.com/NMFS Permit # 822

The black and white pattern of the humpback's fluke is as unique to each individual as a fingerprint. Researchers track humpbacks by photographing and cataloguing "fluke ID's".
Photographer: ©Doug Perrine/Seapics.com/
NMFS Permit # 822

laboratory in the wild. With volcanic origins and clear access to a deep ocean floor in predominantly calm conditions, sanctuary waters inspire an array of whale studies. Hawai'i boasts several leading marine institutions that have long served as a magnet for students and the world's top cetacean scientists. The sanctuary has tapped the local expertise on humpbacks by soliciting proposals for research projects. In all, the sanctuary has contributed funding to 24 research projects, associated with the following themes, methodologies and results:

Population Research: "How many humpbacks are there?" The answer to this question is a reliable indicator of whether the species is making a comeback. Researchers in Hawai'i conducted their first count of humpbacks from above in 1976 using three aircraft that flew over waters surrounding the main Hawaiian Islands. These first aerial surveys noted the number of whales sighted and described the distribution of whales throughout the islands. The findings also ended a long period of skepticism where the actual existence of humpbacks in Hawai`i had become a matter of debate. At the time, so few humpbacks existed that sightings of the animals had become very rare.

More recently, mathematicians helped develop a statistical method for counting whales. The technique, known as "distance-sampling", involves flying over the humpback habitat in an aircraft along a precise route and counting whales at regular intervals. After conducting distance-sampling surveys in Hawaiian waters over the period of the past ten years with partial funding from the sanctuary, Dr. Joe Mobley has concluded that the humpback whale population of the region is increasing at an annual rate of 7 percent each year.

Migration Studies: Humpbacks are intrepid navigators, managing to hone in on a destination after swimming great distances in the trackless sea. Scientists have hypothesized that they are able to use cues from the environment including the earth's magnetic field to chart their underwater journeys. Humpbacks migrate seasonally, travelling approximately six thousand miles between Hawaiian winter breeding grounds and Alaskan summer feeding grounds. The route they take is largely unknown but has been studied recently using satellite tags. These studies, partially supported by the sanctuary, have revealed that whales tagged in Kaua'i appear to take a more-or-less straight line back to the coast of Alaska. From there, they may then return to favored feeding grounds to the east or west.

Whale Behavior Studies: Thanks to their size and acrobatics, humpbacks are popularly depicted as

"gentle giants." Scientists could not discount this perception, without studying how individual whales behave or interact with one another. Observations made by researchers working close to the whales from small boats began to describe the existence of aggressive encounters, where individuals actually injured one another. Drs. Lou Herman and Scott Baker documented particularly boisterous conduct of males in the Hawaiian breeding habitat, noting that the animals move rapidly in groups and compete for proximity to a lone female in the group. Thus, the conventional notion of humpback docility did not withstand the test of science.

Research into humpback whale behavior took a big step forward with the discovery that individual humpbacks sport black and white patterns on the underside of their tail flukes that are as unique as human fingerprints. Researchers began to photograph humpback flukes in Hawai'i as early as 1975-76. The continuation of this photographic effort, partially supported in recent years by the sanctuary, has allowed researchers to document humpback whale life histories, including the social roles and migration routes adopted by individual animals. Researchers in Hawaiian waters and throughout the North Pacific constructed their own catalog of "identified whales," submitting their photographs to a database maintained by the National Marine Mammal Laboratory in Seattle.

Humpback Whale Song Research: Researchers discovered something incredible when they dropped hydrophones in the water. They found that humpbacks make this world a noisy place. Sound travels well in water and humpbacks use this fact to their advantage in many ways. In breeding grounds, male humpbacks sing long mournful notes. Dr. Roger Payne was the first to describe these sounds as "song". The ability to sing what is one of the most complicated note patterns in the animal kingdom has won humpbacks a lot of notoriety.

In Hawai'i, Dr. Jim Darling in the early 1990's began to investigate the question of why humpbacks are such avid composers. Darling became one of the first to discount an earlier theory that males were crooning "lovesongs" to woo females. Instead, he hypothesized that a male uses the song to keep other males at a distance while staking out a potential mate—making the song an aural version of chest-beating. Darling continues to test his hypothesis in Hawaiian waters in studies that receive funding and coordination from the sanctuary.

More on Humpback Social Life: Successful reproduction is key to the humpback's continued vitality. In order to support the humpback recovery, we need to understand humpback mating habits and the key features that make Hawaiian waters a suitable breeding habitat for the species. It is not easy

Humpbacks are famous for breaching. Their huge bodies become nearly airborne as they launch themselves out of the water. Photographer: ©Doug Perrine/Seapics.com/NMFS Permit # 822

During competition for mating, male humpbacks lunge at one another with raised heads.
Photographer: ©Doug Perrine/Seapics.com/NMFS Permit # 633

Research and Technology Blend in Sanctuary Waters

Research into the behavior of humpback whales brings with it a special set of trials by water. "It is challenging in that you have a wild animal that you can't get up close to, you can't put in the laboratory," says marine mammal scientist Paul Nachtigall, who chairs the Research Subcommittee of the Sanctuary Advisory Council. "The question becomes, how do you test your hypothesis about the animal? Many scientists have come up with a lot of very creative methods in the process of their investigations."

Humpback research involves many components of skill, time, and technical expertise that often incur cost. Although, Nachtigall points out, simple ingenuity can sometimes help overcome obstacles.

For instance, he recalls, back in the early days of humpback research, scientists began to address the boggling question: "Do these animals really sing?" Initially, there was skepticism about whether or not the eerie vocalization (now known popularly as whalesong) even existed. Nachtigall credits the invention of an innovative but easy to obtain this information. Humpback gender characteristics are barely discernible to the human eye, making it difficult to tell if a specific behavior is gender-based or related to reproductive status. The animals are also discreet in their mating activity. In fact, the behavior has never been directly documented.

Scientists are, however, beginning to gather some important clues. Recent studies conducted with an innovative technology seem to suggest that size plays a role in humpback whale reproduction. Drs. Lou Herman, Adam Pack and Scott Spitz at the Kewalo Basin Marine Mammal Laboratory in Honolulu developed a special camera-based technology known as underwater videogrammetry that enables an animal's size to be measured. With partial funding from the sanctuary, these researchers found that, for males, size makes a difference: The largest males tend to maintain the position of principal escort in a competitive group. The research is continuing to investigate the role of size in female reproductive success, and how size, on average, varies as a function of social role.

Sanctuary Connects Researchers and Public

The sanctuary takes responsibility for disseminating research and encourages scientists to engage in a meaningful exchange of ideas on new research findings. Researchers who receive sanctuary funding are required to describe their findings in a manuscript suitable for publication in a technical or peer review journal. Additionally, the sanctuary has coordinated humpback whale researcher meetings on Maui. In collaboration with NOAA's National Marine Fisheries Service in 1995, the sanctuary sponsored the unprecedented gathering of humpback whale experts, known as: *Workshop to Assess Research and Other Needs and Opportunities Related to Humpback Whale Management in the Hawaiian Islands*. More recently, the sanctuary partnered with NMFS to present the 1999 Marine Mammal Workshop focused primarily on endangered marine species.

The sanctuary has also made it a priority to acquaint the public with humpback whale scientists and their research. Prominent whale researchers are periodically featured in the monthly Sanctuary Lecture Series on Maui. Staff frequently coordinates local and national publicity for the accomplishments of whale researchers by issuing news releases, facilitating media coverage and creating articles for newsletters and the sanctuary website.

Research Issues Exceed Whales-Only Focus

The sanctuary encourages several streams of marine research. Because the ocean is characterized by diverse ecosystems, comprised of interdependent organisms and processes, research activities address the marine environment from a holistic perspective. Similarly, research on humpback whales has the potential for multiple applications in the field of marine resource management. Therefore, the sanctuary has found it effective to form partnerships with various branches of NOAA as well as other government and private organizations that utilize research.

The Sanctuary Advisory Council has frequently focused on how to best apply research in order to support humpback whale recovery. Recently examined was the issue of collisions between vessels and humpbacks. The statistical likelihood of so-called "whale strikes" is on the rise as both the whale population and boat traffic in Hawaiian waters increase. Given the loss of life and other risks associated with whale-strikes, the Sanctuary Advisory Council Research Subcommittee formulated a list of possible solutions to address the whale strike problem. Subsequently, the sanctuary's concern over whale-strikes has been parlayed into a plan by NOAA to convene a national whale-strike conference.

Future Efforts

The sanctuary staff and the Sanctuary Advisory Council are taking steps to formulate a comprehensive research program. Gaps in the scientific understanding of humpbacks need to be addressed with the goal of improving conservation of humpback whales. While commercial hunting of whales has been banned for nearly half a century, threats to whales remain. Vessel collisions, entanglement with fishing gear and noise pollution have the potential to negatively impact the growth of the endangered humpback population. With the help of research, the sanctuary seeks to clearly define these threats and interpret findings for use by natural resource managers and our community's decision-makers.

The Sanctuary and Native Hawaiian Culture

The ethic of marine stewardship, which is deeply embedded in Native Hawaiian heritage, holds great relevance for a modern marine sanctuary. Early Hawaiians developed techniques to manage their ocean resources without depleting them. *Kupuna*, Hawaiian elders, will tell you about a way of life inseparable

technique for delivering answers: "(Researchers) dropped hydrophones into the water—simple underwater microphones." Among other things, they verified that humpback whales sang loudest at midnight.

The invention and use of hydrophones to study whalesong was not a complex experiment, observes Nachtigall, but it marked a stroke of creative pragmatism that produced results. Nachtigall says this is where the sanctuary comes into the picture: "The sanctuary is not in a position to fund a lot of major projects, but it is, nonetheless, a great source of opportunity. It awards grants to researchers enabling them to put their theories to the test."

Humpbacks create a mesmerizing effect by repeatedly slapping the water's surface with their giant tails. Photographer: ©Doug Perrine/Seapics.com

Lahaina Harbor is one of Hawai'i's several busy intersections for vessel trafic and marine creatures. Photographer: ©Doug Perrine/Seapics.com

Fringing the sanctuary shores is *Ko`ie`ie Loko `a,* an ancient aquaculture pond, constructed by Native Hawaiians long before the arrival of Europeans. Photographer: HIHW Staff

from the surrounding waters. They are the beneficiaries of traditions that were handed down from generation to generation and survive even today. Many ocean-related traditions, however, were lost with the demise of the Hawaiian Kingdom, and some have disappeared with the incursion of western culture. At the same time, contemporary Hawaiians have made a conscious effort to revive customary elements of ocean stewardship, successfully reconstructing practices in aquaculture, subsistence fishing, canoe-making, and navigation.

The staff of the sanctuary and its supporters in the community—share a commitment to bolstering Native Hawaiian traditions of the sanctuary. We recognize that the stewardship of a culture that depended entirely on the natural environment is compatible with the sanctuary's primary goal of resource protection. Beside ensuring that that tradition continues to be practiced within the sanctuary, we are committed to educating the public—Hawaiians and non-Hawaiians—alike about the value that Native Hawaiian heritage holds for the future of the sanctuary.

The Sanctuary and Indigenous Stewardship

Beginning with designation as a sanctuary, we have laid the foundation for culturally sensitive resource management by implementing a NOAA guideline to refrain from limiting subsistence fishing—a primary economic and recreational activity for many Hawaiian citizens. On the advice of Native Hawaiian consultants, including a Sanctuary Advisory Council representative for Hawaiian cultural interests, our sanctuary management plan highlighted elements of Native Hawaiian stewardship. They included: 1) success in fishpond aquaculture with the construction of an elaborate system known as *lokoi' a*; 2) invention of the *ahupua'a*—a system of social and political order based on watershed divisions or mountain-to-shore management of land; and 3) spiritual or religious reverence for several sea creatures as ancestral guardians known as *'aumakua*. In order to support better understanding of these customs and ensure that the Native Hawaiian perspective will be included in our operations, a staff position for a full-time Native Hawaiian Cultural Educator was added.

Cultural Education

A Native Hawaiian intern was hired in 1997 under the University of Hawai'i at Hilo's Hawaiian Internship Program, in conjunction with Sea Grant. The intern conducted research in order to clearly

articulate the Native Hawaiian cultural interpretation of humpback whales and whales in general identified in the Hawaiian language as *koholā*. One of the achievements of this effort is the pamphlet *The Cultural Importance of Whales in Hawai'i*.

Culturally focused education continues to introduce the Hawaiian perspective on marine resources into the general stream of education supported by the sanctuary. Cultural interpretation is provided to visiting student and teacher groups. This involves utilizing the natural assets of the outdoor site, including the historic aquaculture pond at sanctuary headquarters in Maui. Research suggests the pond was constructed in the 16th century and may have been used to cultivate *moi* (Pacific threadfin), a highly prized fish. The sanctuary staff has been meeting with a community group that plans to restore the pond to its original glory.

The Sanctuary and Inter-Agency Cooperation

How can government equitably manage the ocean? Managing this vast and trackless expanse, so widely regarded in American society as both a field of opportunity and a frontier of freedom, is much more complex than land management. History has shown us that, in order to be effective, ocean governance must address the dynamic and interrelated nature of marine ecosystems. In a hallmark of innovation, NOAA and the National Marine Sanctuaries Act have mandated that agencies implement a cooperative and collaborative management strategy.

In an effort to fulfill this mandate, the sanctuary has sought to strengthen its working relationships with other government agencies and organizations involved in protecting humpback whales and natural resources in Hawai'i's humpback habitat. This approach is aimed at increasing flexibility, mobilizing staff resources, avoiding duplication, and broadening opportunities for citizen participation in ocean stewardship.

Partnership for Protection

The sanctuary covers approximately 1,420 square miles of federal and state territory within the main Hawaiian Islands. To ensure fair management of this multi-jurisdictional area, NOAA and the State of

Sanctuary incorporates traditional Hawaiian protocol by including an Hawaiian blessing at the opening of outreach events. Photographer: HIHW Staff

Sanctuary has a ringside seat on humpback habitat. Photographer: HIHW Staff

Kilauea Point is the setting for the Sanctuary's Kaua'i Family Ocean Fair. Photographer: HIHW Staff

In an example of interagency cooperation, Sanctuary Hawaiian Cultural Educator Joylynn Oliveira boards a U.S. Coast Guard cutter to deliver a humpback lecture to students during Education on the Water Day. Photographer: HIHW Staff

Hawai'i signed an Intergovernmental Compact Agreement in 1997. This enables the Hawai'i sanctuary to operate as a partnership with the Hawai'i Department of Land and Natural Resources.

Community Resources

Since its establishment in 1996, the Sanctuary Advisory Council (SAC) has contributed significantly to sanctuary policies and programs that embody a collaborative management approach. The SAC consists of representatives appointed by state and federal government agencies, individual islands (synonymous with counties) and other groups including Native Hawaiian, business, tourism, ocean recreation, education, and research. The SAC meets routinely for the purpose of advising sanctuary managers on how the sanctuary can continue to best serve and engage stakeholders while fulfilling the primary mission of natural resource protection. SAC members make recommendations to managers while also interpreting the goals of the sanctuary to their respective constituencies. While SAC members represent diverse stakeholders and varied opinions, they have also collectively built widespread consensus in support of community-based marine stewardship—the foundation of the sanctuary program. Although the SAC's input is advisory, it serves as a virtual barometer of public support for sanctuary policies and is considered by sanctuary managers in the decision-making process. Examples of the SAC's contributions to cooperative and collaborative management strategy include:

- SAC established subcommittees to improve formulation of technical advice on resources related to education, research, and conservation.
- SAC reviewed and advised sanctuary managers on the development of the Sanctuary Management Plan.
- SAC members helped to organize and participated in some of the major sanctuary-sponsored events: the annual Sanctuary Ocean Count, the 2000 International Marine Debris Conference in Honolulu, the 2000 Sustainable Seas Expedition, and Sanctuary dedication celebrations on Maui and O'ahu in 1998.

Cooperative Management

Our cooperative management strategy has been particularly effective in instances where we have capitalized on the sanctuary's strengths in education and outreach to fill an important niche. While many agencies share our mission of protecting humpback whales, the sanctuary is unique in its vigorous efforts to communicate the public interests at stake in Hawai'i humpback habitat. We initially worked to identify state, federal, and county agencies with similar missions in order to involve them and to provide them with information on national marine sanctuaries. Since then, we have used public events and public information tools to highlight their operations and emphasize the relationships and cohesiveness of marine protection agencies working to ensure health and safety within sanctuary waters. Examples of these efforts include the following:

- Staff and SAC members collaborated with the U.S. Coast Guard to organize a "2001 Education on the Water Day" for 100 students and their teachers aboard the USCG Cutter *Kukui*.
- Staff supported the Environmental Protection Agency and the State of Hawai'i's Department of Health to implement water quality assessment monitoring.
- Each year, the staff partners with NMFS and NOAA Fisheries Enforcement to conduct a statewide series of Ocean User workshops statewide and to produce and publish an Ocean User's Handbook aimed at raising awareness of marine mammal approach regulations that apply in waters surrounding Hawai'i.

Future Efforts

Our revised management plan contains several strategies aimed at increasing our cooperative and collaborative management of sanctuary resources. For example, we need to provide the SAC with a more structured role. In the past, it has been a logistical challenge to convene SAC members who reside on five separate islands. Website technology will be used to facilitate communication of SAC members. A long-term operating plan for the SAC will be developed, and SAC subcommittees will focus on tasks more specific to their fields of technical expertise as they relate to humpback whale protection.

Several as yet unexplored arenas for increased cooperation potentially beneficial to resource protection remain. Looking ahead, it is clear that our mandate for cooperative management can lead us to explore many as yet unchartered waters of innovative humpback whale protection.

Thousands of volunteers participate in a population survey of humpback whales during the annual Sanctuary Ocean Count.
Photographer: HIHW Staff

A natural meeting of two environmental agencies: Pictured here, sanctuary waters meet the shores of the Kilauea Point National Wildlife Refuge. Photographer: HIHW Staff

Schoolchildren learn about ocean careers during Education Day on the Water, jointly sponsored by the sanctuary and the U.S. Guard.
Photographer: Kellie Cheung

Dusk falls over humpback habitat waters off the north shore of Kaua‘i. Photographer: HIHW Staff

The Sanctuary and Human Uses

An ocean sports mecca....A seafood capital....A surfer's paradise....These commonly used nicknames for Hawai‘i hint at the many benefits of living in the midst of a beautiful and healthy ocean. The sanctuary assumes a role in balancing multiple uses of the ocean and protection of humpback whales and their habitat. We work at encouraging citizens to enjoy the resources of the sanctuary without depleting them. Thus, while we strive to highlight the presence of the humpback whales and the needs of the majestic giants in their Hawaiian breeding habitat, we simultaneously stress that the sanctuary provides a wealth of opportunities for commerce, recreation, and traditional Native Hawaiian cultural practices.

The job of fostering social and economic benefits related to marine resources is an inherently challenging one in Hawai‘i. The same coastal waters that cradle humpback breeding activity are also subject to heavy use by people in Hawai‘i. Ocean-related industries involving activities in recreation, tourism, maritime, ocean science and technology, commercial fishing, aquaculture and seafood marketing are estimated to be worth $3.8 billion in annual revenues. Many activities of tourism, which is Hawai‘i's number one economic engine, are based in ocean resources and would not be sustainable without quality water and aesthetic beauty of clean and open coasts. Ocean transportation is also vital to the State's economy. Approximately 750 miles of Hawaiian Island coastline are served by 10 commercial ports and 21 small boat harbors. Hawai‘i residents place a high value on everyday access to the ocean for many purposes, including recreation. In 2000, for example, an estimated 17.3 million people flocked to major O‘ahu beaches. All in all, Hawai‘i's surrounding waters make a priceless contribution by regulating advantageous features of climate, atmosphere and biodiversity in this remote archipelago—more than two-thousand miles from the nearest land mass.

Balancing Conservation and Commerce

The sanctuary implements a management approach that emphasizes sustainable use that will enable future generations to be benefit from a vital ocean that includes humpback whales. If human activities

appear to hurt our resources, we recommend or support measures to prevent harmful impacts. We also educate the public in the philosophy of sustainable use, with the goal of instilling collective responsibility for ensuring that the wealth of Hawai'i's ocean will endure.

The whalewatch industry may qualify as sustainable use that has succeeded in capitalizing on the marine environment while producing positive economic and social benefits for the community. An increase in the humpback whale population over the last two decades has provided the basis for the commercial whalewatch industry. The sanctuary regards the whalewatch industry in a positive light, not only because it generates economic opportunity, but also because it has the potential to contribute to conservation goals. People who observe the colossal humpbacks in the wild will better understand the vulnerability of the endangered species and may be more receptive to messages on wildlife protection.

At the same time, the sanctuary needs to work with whalewatch tour operators to ensure that they conduct activities within the law and do not harm either whales or their habitat. We recognize that commercial success has led to an expansion of the whalewatch industry, leading to more boat traffic and raising the issue of whether we have moved from hunting humpback whales into simply "loving humpbacks to death."

Information seems to indicate that the increase in the humpback population has proven a significant economic boon to Hawai'i due to the corresponding growth in the whalewatch industry. Key findings in a sanctuary-commissioned research project indicate:

- During 1999, the direct commercial impact of whalewatching was $11 million. For the same year, the total economic impact of whalewatching in Hawai'i was $19-27 million. These figures include revenues from related business activity.
- A survey of a visitor group showed 10 percent of the group based its decision to come to Hawai'i partly on the presence of humpback whales. The study suggests that a full accounting of the impact of humpback whales should include the expenditures of such visitors.
- The tour boat industry is one of the fastest growing segments of Hawai'i's economy and supported 3,200 jobs in 1999.

Sanctuary Volunteer Program

An major social benefit of the sanctuary involves our successful creation of the Sanctuary Volunteer

A humpback calf stays by its mother's side for about a year before it matures enough to swim on its own. Photographer: ©Doug Perrine/Seapics.com

Humpback spouts in view of whalewatching boat. Photographer: ©Doug Perrine/Seapics.com/NMFS permit # 822

At the Kaua'i Farm Bureau Fair, a sanctuary volunteer uses a craft activity to introduce a youngster to Hawai'i's environment.
Photographer: HIHW Staff

Program, based at the headquarters in Kīhei, Maui. The opportunity to help in the job of protecting humpback whales has drawn diverse members of the community who gather at the sanctuary. The sanctuary has a volunteer coordinator who recruits and trains volunteers, apprising them of NOAA policies and sanctuary goals. Last year, approximately 700 volunteers contributed a total of 4,500 hours of *pro bono* services to the sanctuary. A core group of approximately 75 volunteers maintains regular weekly hours at the sanctuary, assisting with everything from office chores to the design of educational displays. In anecdotal reports, volunteers credit the sanctuary for enriching their knowledge of and interaction with the ocean. Volunteerism at the sanctuary is a win-win situation and provides a desirable social impact of the sanctuary program. Notable examples of volunteer accomplishments include the following:

- Volunteers assisted in the planning and renovation of a Maui headquarters storage building, which they helped transform into the Sanctuary Education Center.
- Volunteers staff have helped to operate the Sanctuary Education Center; activities have included providing informal tours, disseminating of information, and organizing a book and video collection on humpback whales.
- Volunteers contributed to the Maui headquarters with environmental and aesthetic design, including the creation of mural art and the planting and cultivation of a garden of native plants.
- Volunteers provide staffing and assist sanctuary staff at public education events.
- Volunteers have planned and implemented educational activities for sanctuary events.

Future Efforts

We believe there is a need to expand existing initiatives to make the sanctuary a more valuable asset to coastal residents and to underscore our mandate to protect humpback whales while allowing multiple uses. For instance, in light of the growth of the whalewatch industry and a general increase in boat traffic in Hawaiian waters, we intend to implement a comprehensive boater outreach program targeted for vessel operators. We also plan to expand our Maui program by further collaborating with other nonprofit organizations whose mission is similar to that of the sanctuary. We also are looking at ways to build volunteer programs on O'ahu, Hawai'i's most populated island. The common thread in all these plans is the

effort to encourage involvement in sanctuary programs, and to make our operations truly responsive to community needs.

The Sanctuary and Enforcement

The sanctuary staff does not directly conduct enforcement activities. However, we do provide support to agencies with that responsibility. Several agencies have the authority to regulate human interactions with whales and their habitat including NOAA's National Marine Fisheries Service, NOAA's Office of Law Enforcement, the Hawai'i Department of Land and Natural Resources, and the United States Coast Guard.

One of our main enforcement strategies involves encouraging the public's voluntary compliance with various regulations. Meanwhile, modern marine management clearly demonstrates that the public is more likely to take responsibility for a resource when its value is clearly understood. Therefore, the sanctuary strives to encourage willingness to comply with the regulation by educating the public about the vulnerability of whales, about the need for their protection, and about specific laws that are intended to keep the animals safe from harm.

State and federal regulations prohibit the "taking of whales," a term that encompasses activities that potentially disturb the animals' natural behavior. This means that it is illegal to kill, hunt, capture, restrain, collect or pursue any humpback whale unless authorized by special government permit. Within Hawaiian waters, the "taking of whales" also means a prohibition on intentionally getting closer than 100 yards to a humpback whale. Authorized by the Marine Mammal Protection Act, the so-called "approach law" is intended to create a protective barrier around humpbacks in their winter breeding grounds.

NOAA's Office of Law Enforcement and the State of Hawai'i Division of Conservation and Resources Enforcement (DOCARE) have primary authority to enforce laws against the taking of whales. The sanctuary assists their efforts in many ways. For the last five years, the sanctuary has provided funding for a NOAA enforcement officer, based at sanctuary headquarters for the duration of whale season. The officer investigates complaints of possible instances of whale harassment.

The Status of Hawai'i's Humpback Whales

Thousands of volunteers participate in a population survey of humpback whales during the annual Sanctuary Ocean Count.
Photographer: HIHW Staff

Vessels and humpbacks often come in close contact in Hawaiian waters. Photographer: Sue Canja

Familiarity with Resources Breeds Respect Among Users

It may be common for conservation and commercial interests to come into conflict when it comes to natural resources. But when it comes to humpback whales, the founder of one of Hawaii's most commercialized enterprises would like to get the word out that cooperation is not unusual. Jim Coon, who arrived in Hawaii over 30 years ago, the result of what he describes as quasi-shipwreck experience, says most whalewatch cruise operators consider themselves huge fans of the colossal animals as well as their keepers: "They're out on the water everyday and they get to know humpbacks like no one else. It's been my experience that the whales are really aware of human activities. I've been in situations where individual creatures show signs of recognizing my boat. Knowing how sensitive they are makes me want to do all I can to be a good neighbor in the ocean."

Coon, who sits on the Sanctuary Advisory Council, says the sanctuary has proved itself despite the fears of some boat operators: "The creation of the sanctuary has helped bring whales back to Hawai'i and it's also helped make whalewatching one of Hawai'i's most popular pastimes. Commercial tour boat operators really appreciate this, and they are among some of the most ardent conservationists you'll find anywhere."

Are humpback whales recovering from their brush with near-extinction? The species appears to be making a rebound thanks to its inherent resiliency as well as the protection provided by humans.

It's not entirely clear when humpbacks first arrived in Hawaiian waters. Early Native Hawaiians spoke reverently in sacred chants and legends about the whales that they named *kohol*. Records of European settlers confirm sightings of humpbacks off Hawaiian coasts in the early 18th century. Yankee whaling ships cruised the same waters, but humpbacks were not their target until years later, when other whale species had become severely depleted.

Beginning in 1905, the slow-swimming humpbacks were hunted commercially for their yield of oil and baleen. By the middle of the 20th century, only about 1,000 of the animals remained in the North Pacific. Sightings of humpback whales off Hawai'i remained so rare that even some marine experts dismissed the idea of a Hawaiian humpback habitat as pure rumor.

Today the anecdotal picture is much rosier. Geyser-like fountaining, explosive splashes and the unfurling of huge fins fill the horizon each winter. Even if you're only looking seaward out of the corner of your eye, humpbacks appear to be making a comeback. It's not surprising that the humpback whale has been designated Hawai'i's official State Marine Mammal.

Aided by research, the sanctuary has supported an accurate and reliable assessment of humpback population size that does, in fact, confirm the heartening eyewitness reports. The sanctuary provided partial funding for a seven-year survey of waters around the Hawaiian Islands by whale scientist Joe Mobley. Using "distance sampling" methodology" in aerial studies conducted in 1993, 1995, 1998 and 2000, Mobley's findings show that humpbacks are increasing at an annual rate of seven percent—a statistically significant expansion. If the trend continues, the humpback population may double every thirteen years.

Mobley's numbers are consistent with those of another researcher, John Calambokidis who calculated an estimate for the entire North Pacific stock over a three-year period using a procedure, which computes recurrent sightings of humpbacks. The two independent lines of research quantify the same seven percent increase. Translated into census estimates, this means Hawai'i plays host each winter to approximately 5,000 of a total North Pacific stock of 8,000 animals. If these figures are accurate, Hawai'i's humpback whale population may now be over half of what it was in the pre-whaling days.

Data from both Calambokidis and Mobley are used by the National Marine Fisheries Service to determine official stock assessments upon which conservation policies are set. Encouraging as the

new findings may be, however, there is a need for caution.

While things look good for humpbacks at the present time, a much longer window of time is needed to monitor the species' recovery, before it is judged to be a complete success. One factor of special concern is the humpback's relatively long gestation period of twelve months and a predominance of single births. The resulting low birth rate had been the basis for projecting that the humpback population would need several decades to expand.

While the recently documented 7 percent expansion rate more than meets the most positive expectations, it may be the lucky outcome of several coinciding circumstances: The cessation of whaling ridded the seas of the greatest threat to humpbacks. At the same time, nature has been kind to the feeding habitat of the North Pacific humpback stock; no major natural disasters have curtailed the animal's abundant food supply in higher latitudes. Additionally, government regulations, which restrict human contact with humpbacks, have minimized harassment of the animals in both feeding and breeding grounds.

Nevertheless, marine conservation of any resource must keep pace with changes brought about by either human or natural impacts. There are many new developments in Hawaiian waters that could potentially affect humpback whale recovery. Increasing coastal development, polluted run-off, oil and chemical spills, and other pollution from land-based sources have degraded feeding and breeding habitats of many marine creatures in Hawai'i's surrounding waters. There is mounting proof that human population growth has contributed directly to overfishing and the serious decline of several Hawaii fisheries. Plastic debris—in the form of discarded fishing gear—has led to more incidents of marine life entanglement and ingestion, leading to injury and loss of marine life. Sudden increase in any of these negative impacts in Hawaii can lead to loss of breeding habitat—a leading cause of population decline for any wildlife species.

There are many reasons why humpbacks find Hawaiian waters suitable. Hawai'i's underwater visibility, warm waters, a variety of ocean depths, and the lack of any natural predator spell peace and tranquility for whales. The sanctuary extends a mantle of protection in the effort to ensure that conditions remain suitable for the species to continue to prosper.

Another group of folks especially fond of whales is senior citizens—many of them mainland retirees who live just a few doors down from the sanctuary and have found it a pleasant place to volunteer. The sanctuary's volunteer coordinators appreciate the affection the seniors demonstrate for the environment, though, she adds, it's hard to generalize about the individual motives for giving their time and talent to the sanctuary. Gloria Adlawan sums it up, "I grew up in Kīhei and have witnessed changes over time to the Hawaiian coastline and the depletion of marine resources. Volunteering gives you a sense of satisfaction, no matter how small it seems," says Adlawan. "Every little bit helps — educating little kids, picking up litter...volunteering makes you makes you feel like you've done something. It comes from the heart."

Male humpback whale in a competive group arches to block a rival–possibly the action that gave rise to the name "humpback."
Photographer: ©Doug Perrine/Seapics.com/NMFS permit # 822