

## 4. Purpose and Need

The NMSA requires the ONMS to periodically evaluate the progress toward implementing the management plan and goals for each sanctuary, focusing on the effectiveness of site-specific management approaches. This evaluation is called a management plan review, during which ONMS reviews and, as appropriate, revises the management plans and regulations as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. § 1434(e)) to ensure that each sanctuary continues to best conserve, protect, and enhance their nationally significant natural and cultural resources. The Hawaiian Islands Humpback Whale National Marine Sanctuary management plan was last updated in 2002.

As a result of the management plan review, NOAA is proposing revisions to the terms of designation and the sanctuary-specific regulations in addition to the revised management plan. This includes a proposal for including additional areas within the sanctuary, as well as a proposal for new ecosystem-based regulations for discrete areas within the sanctuary. The proposed actions trigger a need for an environmental impact statement (EIS) under the NMSA (16 U.S.C. § 1434(a)(4)). The EIS focuses on presenting and analyzing proposed changes to the sanctuary regulations, boundary, and non-regulatory actions.

This management plan review process provided sanctuary management with an opportunity to consider the value of marine ecosystems across the state, assess existing threats and protection to these valuable resources, and determine where the NMSA can provide added value to the resource management efforts provided by the state and other federal agencies. Amendments to the NMSA in 1988, 1992, 1996, and 2000 have strengthened and clarified the conservation principles for the program, including increased enforcement efforts, improved natural resource damage assessment tools, and emphasis on the protection of cultural resources. Further incorporating these new tools and techniques into the current management plan would allow for improved management and conservation, which are needed to slow both the short and long-term decline of marine ecosystems throughout Hawai'i.

The management plan review process provided an opportunity to consider a broader context for marine resource management needs in Hawai'i (Table 6). A review of the public scoping comments suggests that there is a range of issues that would benefit from additional management attention. Many people commended sanctuary management for their active role promoting the conservation of humpback whales and their habitat and suggested there were more opportunities

### What is an Ecosystem?

An ecosystem is defined as a community of living organisms (e.g., plants, animals and microbes) in conjunction with the nonliving components of their environment (e.g., air, water and mineral soil), interacting as a system. Humans are an integral part of marine and terrestrial ecosystems. The "interconnectedness" within and among ecosystems is provided both by the physical environment (for example, currents transporting larvae from one part of the ecosystem to another) and by biological interactions (for example, kelps or seagrasses creating habitat or predators consuming prey).

### What is a Healthy Ecosystem?

A healthy ecosystem is one with the capacity to maintain:

- (1) Biotic structure, diversity, and interactions between species and the environment;
- (2) Biological productivity and functions;
- (3) Resilience (Costanza & Mageau 1999; Rapport & Maffi 2011).

**Defining Ecosystem-Based Management in Hawai‘i**

The sanctuary advisory council Ecosystem Protections Working Group developed a definition of ecosystem-based management based on both traditional Native Hawaiian concepts of management and western ecological knowledge and includes protection of both human uses and ocean habitats and species. The definition reads as follows:

*Protect and Promote Sustainable Human Use*

Protect and develop connections that humans have with the marine environment, their associated knowledge systems and socio-cultural traditions. Promote inter-generational cultural transmission of those knowledge systems and the preservation and perpetuation of local traditional and ecological knowledge that is place based. Promote sustainable use of marine resources; preserve and enhance ecosystem services (including ecological and socio-cultural services).

*Protect and Conserve Ocean Habitats and Species*

Protect areas of habitat complexity, areas of high biodiversity, endemism and cultural value, and key ecological species and functional groups. Protect a range of habitat types and critical biological zones (e.g. spawning grounds, juvenile nursery habitat), protect and recover if necessary populations of keystone or determinant species, such as habitat builders (e.g. reef-building corals) and key ecological functional groups (e.g. reef herbivores, top predators). Recover depleted populations of endemic species; and conserve species and places of high cultural value (e.g., underwater heiau, archeological sites, fishponds).

to continue to expand efforts in this area. It was also proposed that the sanctuary consider expanding the scope of management to also conserve additional marine species and habitats. It was suggested that there is a need to address anthropogenic threats to the marine environment including water quality, offshore development, and climate change. Commenters also identified opportunities to improve and expand upon enforcement, management effectiveness, and marine animal assessment and response, and recommended that Native Hawaiian culture and maritime heritage need be considered and integrated throughout sanctuary management and planning. Ocean literacy was identified as the cornerstone of sanctuary activities and would need to continue to play a significant role in sanctuary activities moving forward. Other tools that were proposed for sanctuary management included research, regulations, and boundary modifications.

An ecosystem-based management approach would provide sanctuary management with the platform to begin to address the full suite of issues proposed during the public comment period. An ecosystem-based management approach that is more comprehensive and inclusive of all aspects

of the marine ecosystem than a single species approach. It emphasizes the biological, physical, and human components of a healthy marine environment. Humpback whales and their habitat are an essential component of the marine ecosystem in Hawai‘i and the sanctuary would continue to support current programs, but under this new approach the sanctuary will also have the opportunity to engage in research, response, community engagement, and education in all other areas of the marine environment.

Ecosystem-based management is defined as an “environmental management approach that recognizes the full array of interactions within an ecosystem, including humans, rather than considering single issues, species, or ecosystem services in isolation” (Christensen et al. 1996, McLeod et al. 2005). The goal of ecosystem-based management is “to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need.” McLeod et al. explain that “ecosystem-based management differs from current [management] approaches that usually focus on a single species, sector, activity, or concern; it considers the cumulative impacts of different sectors” (McLeod et al. 2005). Ecosystem-based

management is currently recognized as the most effective mechanism to preserve our national marine resources. The National Ocean Policy Implementation Plan (2013) directs resource management agencies to utilize ecosystem-based management with an adaptive management approach. The sanctuary advisory council Ecosystem Protections Working Group also proposed ecosystem-based management to protect marine resources within the sanctuary.

#### **Integrating Nature and Culture in Hawai'i**

In his cultural-historical narrative of Ka'eo ahupua'a and other ahupua'a within the Honua'ula area, Kepa Maly writes:

All forms of the natural environment – from the heavens and mountain peaks, to the valleys, *kula* (flat sloping lands) and lava plains, and to the shoreline and ocean depths; as well as the winds, rains, clouds, stars in the heavens, and all forms of life – animate and inanimate – were believed to be embodiments of Hawaiian gods and deities. One Hawaiian genealogical account records that Wākea (sky father) and Papa-hānau-moku (island-bearing 'Earth' mother), also called Haumea-nui-hānau-wā-wā (Great Haumea-born time and time again), and various gods and creative forces of nature, gave birth to the islands.

As the Hawaiian genealogical account continues, we find that these same god-beings or creative forces of nature (parents of the islands), were also the parents of Hā-loa-na-ka-lau-kapalili (long stalk, quaking and trembling leaf). This Hāloa was born as a "shapeless mass" and buried outside the door of his parents' house (Pukui and Elbert 1981), and from his grave grew the *kalo* (taro). The next child born to these god-parents was also called Hāloa (the long stalk or breath of life), and he is credited as being the progenitor of the Hawaiian race (Malo 1951, Beckwith 1970, Pukui and Korn 1973). It was in this context of kinship, that the ancient Hawaiians addressed their environment and it is the basis of the Hawaiian system of land use. (*He Mo'olelo 'Āina no Ka'eo me Kāhi 'Āina E A'e Ma Honua'ula O Maui* 2005).

An ecosystem-based management approach was used by Native Hawaiians in the conservation of both land and aquatic resources (Kikoloi 2011, Andrade 2008, and McGregor 2007). Hawaiian culture viewed biological and cultural resources as being interrelated and therefore all biological resources were culturally significant. Hawaiian tradition assigns people the role as stewards of the natural environment. This relationship is present in the Hawaiian language (i.e., E Mālama I Ke Kai (to care for the ocean), Mālama 'Āina (to care for the land), and Aloha 'Āina (love of the land)). Cultural practice clearly defines how people are expected to collect natural resources (i.e., ferns and flowers). Additionally, harvesting fish and planting crops followed cyclical patterns. It has been suggested that any culturally sensitive discussion on land use in Hawai'i, one must understand that Hawaiian culture evolved in close partnership with its natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture ends and nature begins" (Maly 2001). The Native Hawaiian Working Group recommended that sanctuary management incorporate sustainable use of biocultural resources into planning to ensure future generations can benefit from the natural environment.

#### **4.1. Need for the Proposed Action**

ONMS completed the most recent management plan review for the Hawaiian Islands Humpback Whale National Marine Sanctuary management plan on [date]. This review uncovered the following issues:

- (1) The Hawaiian Islands Humpback Whale National Marine Sanctuary (“the sanctuary”) currently operates with a single species focus, as opposed to an ecosystem based management focus that would be consistent with most other national marine sanctuaries. The single species focus does not represent the most effective approach to resource management, and does not efficiently meet the requirements of the NMSA.
- (2) Some existing sanctuary regulations protecting humpback whales lack clarity.
- (3) Some sanctuary boundaries on the islands of O‘ahu and Kaua‘i are not aligned with other existing state and traditional use management areas, which has complicated sanctuary administration and management.
- (4) Marine areas outside of the sanctuary have been identified which meet the national significance criteria for inclusion within the sanctuary. These areas, located around the island of Ni‘ihau and Lehua Rock (approximately 218 square miles) contain significant stands of healthy coral, populations of marine mammals, including whales and monk seals, as well as important historic and cultural resources.
- (5) The 2002 management plan lacked several desirable non- regulatory management measures including: community involvement; outreach and education; research that not only addresses overall sanctuary needs, but focuses on several high priority areas; and focused management approaches to address specific issues in Maunalua Bay (O‘ahu), Ni‘ihau, Pīla‘a (Kaua‘i) and Ma‘alea Bay (Maui).
- (6) Change the name of the sanctuary from Hawaiian Islands Humpback National Marine Sanctuary to Hawaiian Islands National Marine Sanctuary: Nā Kai ‘Ewalu. The change in scope of the sanctuary to ecosystem based management renders the existing name obsolete.

The proposed action triggers a need for an environmental impact statement (EIS) under the NMSA (16 U.S.C. § 1434(a)(4)). The EIS focuses on presenting and analyzing proposed changes to the sanctuary regulations, boundary, and non-regulatory actions.

## 4.2. Purpose of the Proposed Action

The purpose of the proposed action is to resolve the issues identified during the management plan review (Section 4.1) in order to fulfill the purposes and policies of the NMSA (16 U.S.C. § 1434(e)), ensuring that each sanctuary continues to best conserve, protect, and enhance their nationally significant natural and cultural resources.

The purpose of developing a new management plan and associated regulations and boundary changes is to best fulfill the needs identified through the management plan review process and the directives of the NMSA to move towards a more ecosystem-based management approach guided by traditional native Hawaiian principles of resource management. The management plan review process assesses the need, and proposes how best to revise sanctuary goals and regulations and develop new action plans and activities. Following the public scoping meetings, sanctuary staff identified a need to establish a new vision, mission and values for the sanctuary. These elements were inspired by the outputs from the *Visioning Workshop* conducted with the sanctuary advisory council and input from sanctuary staff. 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.

### Vision

The sanctuary, as a place, realizes a healthy and diverse ocean environment, with thriving communities of responsible ocean stewards striving to maintain a balance of appropriate uses and ensure the perpetuation of the natural and cultural systems that define Hawai'i.

### Mission

The sanctuary promotes a holistic and adaptable management approach that perpetuates the natural health of the environment, supports sustainable use, fosters local stewardship and community involvement, and perpetuates the cultural heritage of Hawai'i.

The values are presented through Hawaiian concepts that describe a holistic and adaptable approach to resource management.

## Values

### **'Auamo kuleana** (*carry responsibility*)

As stewards of the 'āina, both land and ocean, we embrace our responsibility for the ocean and people of Hawai'i. This responsibility is made easier through working together, and sharing and receiving knowledge from communities throughout Hawai'i, past and present. Through fulfilling our kuleana (responsibility), we honor and acknowledge our accountability to the ocean and the people of Hawai'i.

### **Aloha 'Āina** (*love of the land*)

The concepts of aloha 'āina (love of the land) and mālama 'āina (to care for the land) encompass all areas mauka (inland) to makai (ocean). 'Āina is not only the dirt and rocks of Hawai'i but also the ocean; it is what provides 'ai (food) for Hawai'i. In Hawai'i, people often feel an emotional and familial connection to the land and ocean, so we recognize that our relationship to the 'āina of Hawai'i is what moves us to care for this environment, and by doing so care for ourselves.

### **Huliāmahi** (*many hands*)

We believe that no task is too great when shared by all. Our effectiveness is enhanced through collaboration, magnified through our partnerships, and realized through results-based management. We value our place within the 'ohana of our communities, and we strive for active and robust community engagement.

### **Ho'okaulike** (*to balance*)

We strive for a healthy balance between the natural environment of Hawai'i, the communities it supports, and the linkage to our cultural heritage. A healthy ecosystem relies on an uninterrupted connection between mauka and makai, which is the lifeline of a balanced system supporting both humans and the natural environment.

### **A'o aku, a'o mai** (*to teach, to learn*)

The sanctuary strives to be both a leader and a learner, using our strengths to nourish and conserve Hawai'i's ecosystems and culture, sharing our experiences, and seeking the wisdom of others. We gather and use this knowledge to both better understand the ocean that surrounds our islands and to inform our decisions about leaving a better place for future generations.

### **Ka wā ma mua, ka wā ma hope** (*the time before, the time after*)

There is a great wealth of knowledge from the past that provides historical answers and informs our management decisions that will affect the future. "The time before" refers to the past because it comes ma mua (before) the present; "the time after" refers to the future because it comes ma hope (after) the present.

### **Makawalu** (*eight eyes*)

We recognize that there are many perspectives and ways to understand our surrounding environment, including our place and role within it. We strive to honor the diversity of knowledge systems in Hawai'i, as well as the many methodologies and approaches for understanding and interacting with the natural world.

Sanctuary staff also developed guiding principles and corresponding revised sanctuary goals to develop a contemporary set of activities. The guiding principles provide direction for making informed decisions on the overarching policy and guidance for sanctuary management.

### Guiding Principles

#### Honoring the Uniqueness of Hawai'i

The ecosystems in Hawai'i are unlike any other in the world (e.g. endemism, Roberts et al. 2002), and the traditional practices and diverse communities in these islands are equally unique. In order to perpetuate the health of these ecosystems, practices, and communities, the sanctuary will strive to understand them and the ways they are interconnected. Place-based management for different areas may be the most effective way to protect uniqueness of each setting.

#### Diverse and Continuous Learning

A set of cultural values have been identified to support a new management approach and includes diverse ways of learning, including traditional perspectives, contemporary place-based knowledge, and scientific research methods and processes. All knowledge resources will be considered and used to inform the development of sanctuary programs and management decisions.

#### Rigorous Progress Assessment

Sanctuary managers and staff are mindful of the need to ensure successful implementation of the management plan and related actions. Subsequently, there is an action plan focused on both time-tested and innovative ways to assess progress.

#### Flexible and Adaptive Management

Incremental progress assessment and an ever-growing understanding about the marine environment necessitate an adaptive management approach to enhance the capacity of resource managers to learn and adjust as conditions change. Sanctuary managers will need to adapt to fluctuations both in the physical environment and within communities.

The sanctuary goals are the unifying elements of successful sanctuary management. They identify and focus management priorities, resolve issues, and link to the public interest in preserving and caring for sanctuary resources.

### GOALS

- Goal 1** Holistically manage biocultural resources in the sanctuary using an ecosystem-based approach to promote the health of the natural and human environment.
- Goal 2** Share mutual learning opportunities and build knowledge to enhance understanding and appreciation of biocultural resources in the sanctuary to promote equitable, responsible and sustainable ocean uses.
- Goal 3** Inspire local stewardship by engaging communities and stakeholders in cooperative conservation to increase place-based protection of ocean resources.
- Goal 4** Perpetuate cultural heritage by integrating cultural perspectives into sanctuary programs and using them to guide future management decisions.
- Goal 5** Use collaborative and adaptive management approaches to optimize effectiveness.
- Goal 6** Establish best management practices and approaches to demonstrate that lasting, sustainable, and replicable results can be achieved throughout the Hawaiian Islands and applied to settings beyond Hawai'i.

## 5. Proposed Action and Alternatives

### 5.1. Alternative Development Process

The proposed action and the alternatives, including the proposed boundary adjustments, meet the sanctuary designation standards of Section 303 of the NMSA (see sidebar). The sanctuary advisory council working groups considered management actions necessary to conserve marine resources within the proposed sanctuary boundaries. Their recommendations were then considered in the development of the proposed ecosystem-based regulations to add additional protection to marine resources within the sanctuary. The proposed transition from single species management of humpback whales to ecosystem-based management is consistent with ongoing federal and state initiatives to provide additional protection and sustainable management of marine resources in Hawai‘i.

### 5.2. Alternatives Considered but Eliminated

A variety of strategies were suggested during the public scoping process indicating support in areas such as expanding the sanctuary, de-designating the sanctuary, and adding additional species to sanctuary management. Some of these strategies were not developed into alternatives because they did not achieve the Purpose and Need for Action (see Section 4) or it was determined that they were unreasonable because they were either technically or financially infeasible. The following strategies were eliminated from consideration for the reasons discussed below.

#### *No Sanctuary*

During the public scoping process, a small number of commenters requested that NOAA and the State of Hawai‘i cease to manage a sanctuary in Hawaiian waters. These individuals claimed that the humpback whale population had recovered so there was no longer a need for the sanctuary. Additionally, they expressed concern about the potential loss of livelihoods or restriction to rights of access that could result if sanctuary regulations and prohibitions were expanded.

The proposed action was eliminated from consideration because it would be infeasible to effectively manage marine resources without a sanctuary. Terminating the management of a national marine sanctuary in the populated Hawaiian Islands would not meet the purpose and need for action. The first goal of sanctuary management is to holistically manage biocultural resources in the sanctuary using an ecosystem-based approach to promote the health of the natural and human environment. Without a sanctuary, the proposed management plan and ecosystem-based regulations would not be implemented and the program would fail to effectively manage marine resources. The second goal of sanctuary management is to share

#### **National Marine Sanctuaries Act (NMSA) Sanctuary Designation Standards (16 U.S.C. §1433 (a)(2))**

A National Marine Sanctuary is an area of national significance based on:

- The conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or esthetic qualities;
- The communities of living marine resources it harbors;
- Its resource or human use values.

Existing state and federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management.

The area is of a size and nature that will permit comprehensive and coordinated management.

mutual learning opportunities and build knowledge to enhance understanding and appreciation of biocultural resources in the sanctuary to promote equitable, responsible and sustainable ocean uses. If the sanctuary were to cease in Hawai‘i, existing coordination mechanisms (i.e., the sanctuary advisory council) would cease to exist and the public may have less ability to influence research, education, enforcement, and management of humpback whales and their habitat in these critical areas. Additionally, all sanctuary funded contracts for research, education, and information dissemination would cease. The sanctuary offices on Maui, O‘ahu, and Kaua‘i would shut down and no longer provide opportunities and venues for public education and outreach. The thriving volunteer programs and award-winning Ocean Count program would also cease to operate if the sanctuary were to shut down.

### ***Adding Limited Additional Species***

During the 2002 Management Plan Review process, the public requested that sanctuary management consider strategies to protect additional marine species. NOAA assessed a range of marine species for possible inclusion in the sanctuary including Hawaiian monk seals, hawksbill sea turtles, false killer whales, and maritime heritage resources. The assessment considered population trends, past and current threats, existing management authorities, and conservation needs. The proposed action was eliminated from consideration because it would be infeasible to effectively manage marine resources using a species-management approach. Adding limited additional species would not satisfy the goals outlined in the purpose and need for the sanctuary. In particular, a species-management approach fails to holistically manage biocultural resources in the sanctuary. Additionally, the NMSA calls for a “comprehensive approach to the conservation and management of the marine environment” (16 U.S.C. §1431 *et seq.*, 301 (3) (3)).

### ***Expand Boundary to 1000-Fathom Isobaths around the Populated Hawaiian Islands***

The 1997 Hawaiian Islands Humpback Whale National Marine Sanctuary Final Environmental Impact Statement/Management Plan (1997 EIS) considered a sanctuary boundary that extended from the shoreline out to the 1000-fathom isobath around the entire populated Hawaiian Islands. Although there was a general consensus among scientists at the time that humpback whale habitat is generally within the 100-fathom isobath, the 1997 EIS notes that about a quarter of humpback whale sightings had occurred between the 100-fathom and 1000-fathom isobaths (Mobley et al. 1993). The 1997 EIS analysis suggested that the additional area may include important humpback whale use areas and would provide a buffer around the 100-fathom isobath.

This strategy was not considered in the current range of alternatives because the cost of managing such a large area was not feasible and the resource demands would exceed the sanctuary budget. The sanctuary boundaries would extend out to 40 miles in some areas and if research and enforcement activities were dispersed over such a large region, it would diminish effective management in nearshore areas of the sanctuary. Additionally, the 1997 EIS suggested that extending the boundary out to the 1000-fathom isobaths would interfere with military areas and activities that are essential to national security and defense.

### 5.3. Description of Proposed Action and Alternatives

This section provides a description of the proposed action and alternatives for consideration in the draft management plan, including the proposed changes to regulations. The sanctuary is considering three alternatives to achieve the proposed goals (described in Section 4 Purpose and Need), as well as a No Action alternative. The No Action alternative (Alternative 1) proposes that the sanctuary continue to operate under the *2002 Management Plan* without any additional regulations or boundary changes. Alternatives 2-4 propose a revised management plan as a way to coordinate a transition from a single species management approach to an ecosystem-based management approach. Alternatives 2-3 propose extending the western sanctuary boundary on the north shore of O‘ahu to include Ali‘i Beach Park, extending the sanctuary boundaries on north shore of Kaua‘i to include the Pīla‘a ahupua‘a and the Hā‘ena ahupua‘a, extending the boundary around the ledges on the south end of Penguin Bank, and establishing new sanctuary boundaries around Ni‘ihau. Alternative 4 proposes these boundary extensions plus one additional boundary extension on the north shore of Kaua‘i to include the Hanelei River. Alternative 2 proposes new and revised sanctuary-wide regulations to apply to the existing sanctuary area and the proposed boundary additions. Alternative 2 also proposes Special Sanctuary Management Area regulations for the Penguin Bank and Maui Nui areas (outside of 3 nautical miles). Alternative 3 proposes the same new and revised sanctuary-wide regulations and extends the Special Sanctuary Management Area regulations to apply to Maunalua Bay in addition to the Penguin Bank and Maui Nui areas. Alternative 4 proposes to extend the Special Sanctuary Management Area regulations to the entire sanctuary. For each alternative, the proposed actions are described below, including any proposed management changes, boundary adjustments, or regulations.

#### **5.4. Alternative 1: No Action**

Alternative 1 proposes that the sanctuary maintain status quo operations. Under this alternative, NOAA would continue to follow the *2002 Management Plan* for HIHWNMS and there would be no changes to the current sanctuary regulations or current sanctuary boundaries. However operating under the *2002 Management Plan* does not mean reverting to 2002 operations. Sanctuary programs have evolved over the past decade and many programs have expanded to include additional resources found within the sanctuary. A recent assessment of the *2002 Management Plan* found that the sanctuary had become engaged in several activities that support broader missions, particularly in the areas of resource protection and education and outreach. For example, sanctuary programs have been set up for monitoring water quality, introduced limu, fish, and ‘opihi. Additionally, sanctuary staff have provided assistance in stranding and disentanglement of monk seals, green sea turtles, and other cetaceans. A full description of these sanctuary activities is provided in the “2002 Management Plan Assessment” (HIHWNMS 2011).

Currently, there are six activities that are prohibited in the sanctuary with the intent of protecting humpback whales and their habitat (15 C.F.R. §922.184 (a)(1) – (5)). It is currently prohibited to approach or cause a vessel or other object to approach a humpback whale within 100 yards or to operate an aircraft within 1,000 feet of a humpback whale. Taking or possessing any portion of a humpback whale is also prohibited unless authorized under the Marine Mammal Protection Action (MMPA) or the Endangered Species Act (ESA). It is also prohibited to discharge material or alter the seabed of the sanctuary in a way that that injures a humpback whale or humpback whale habitat if it is unauthorized by other Federal or State permit, license, lease or other authorization. Finally, it is prohibited to interfere with an investigation or enforcement effort (15 C.F.R. §922.184(6)). These prohibitions do not apply to emergency or law enforcement situations (15 C.F.R. §922.184(b)). Sanctuary regulations also state that any sanctuary fishery regulations shall not take effect in Hawai‘i State waters until established by the State Board of Land and Natural Resources (15 C.F.R. §922.184(c)).

Although Alternative 1 does meet the statutory requirement for management plan review (NMSA Sec. 304(e)), it does not fulfill the revised sanctuary goals set out in Section 4 of this document.

## 5.5. Alternative 2

Alternative 2 proposes a revised management plan as a way to coordinate a transition from a single species management approach to an ecosystem-based management approach. The revised management plan would replace the *2002 Management Plan* as the basis for sanctuary operations. Alternative 2 proposes extending the western sanctuary boundary on the north shore of O‘ahu to include Ali‘i Beach Park, extending the sanctuary eastern and western boundaries on the north shore of Kaua‘i to include the Pīla‘a ahupua‘a and the Hā‘ena ahupua‘a, extending the boundary around the ledges on the south end of Penguin Bank, and establishing new sanctuary boundaries around Ni‘ihau. Alternative 2 also proposes new and revised sanctuary-wide regulations to apply in existing sanctuary areas and proposed boundary additions. The revised sanctuary wide-regulations are largely modeled off the current sanctuary-wide regulations with the following changes: (1) the regulations prohibiting the take and possess of humpback whales would be combined; (2) the approach regulation would be clarified and articulated; (3) the prohibition against discharge would be removed; (4) the prohibition on altering submerged lands would be removed; and (5) authority to issue permits and authorizations would be added. Additionally, Alternative 2 proposes a new sanctuary-wide regulation prohibiting the disturbance of submerged cultural and maritime heritage resources. Alternative 2 proposes Special Sanctuary Management Area regulations to apply to the Penguin Bank and Maui Nui areas (outside of 3 nautical miles). Special Sanctuary Management Area regulations would include prohibitions against: (1) taking or possessing additional marine species; (2) discharge; (3) altering submerged lands; (4) using explosives; (5) introducing non-native species; and (6) damaging or destroying signs.

### 5.5.1. Revised Management Plan

The Office of National Marine Sanctuaries (ONMS) and the State of Hawai‘i have prepared a revised management plan (Section 10) with input from the sanctuary advisory council, the public, state and federal agencies, and other constituents. The revised management plan describes an ecosystem-based management approach to the conservation of resources within the sanctuary. Ecosystem-based management is an integrated approach that considers all key activities, particularly anthropogenic, that affect marine environments (see definition in Section 4 Purpose and Need). The draft management plan updates the sanctuary mission, vision, and goals to better reflect the new management approach. The draft management plan includes sixteen action plans. Action plans are designed to directly address current priority resource management issues and guide management of the sanctuary over the next five to ten years. The action plans identify and organize a wide variety of management tools sanctuary staff could employ. Action plans would allow ONMS to articulate the programs and projects it uses to address the resource issues identified for this management plan, to fulfill the purposes and policies of the NMSA, and to achieve sanctuary goals. In general, action plans are designed to address:

- The management issues identified during the management plan review process;
- The goals and objectives of the NMSA and the sanctuary;
- Extensive comments, input and ideas from the sanctuary advisory council;
- The scientific, socioeconomic, and local knowledge gathered about the status of sanctuary resources and resource management issues;

- The unique, non-duplicative, and beneficial services the sanctuary can offer to improve resource management; and
- The need for evaluating the effectiveness of the sanctuary over time.

The action plans would be sorted into five thematic areas that serve to organize and structure the plans as outlined in Table 7.

| Thematic Area                               | Action Plan  |
|---|--|
| <b>Implementing Ecosystem Management</b>    | <ul style="list-style-type: none"> <li>• Understanding and Managing Species and Habitats</li> <li>• Resilience to a Changing Climate</li> <li>• Water Quality Protection</li> </ul>                    |
| <b>Perpetuating Cultural Heritage</b>       | <ul style="list-style-type: none"> <li>• Living and Evolving Cultural Traditions</li> <li>• Maritime Heritage</li> </ul>   |
| <b>Transitioning Towards Sustainability</b> | <ul style="list-style-type: none"> <li>• Community Partnerships</li> <li>• Ocean Literacy</li> <li>• Sustainable Use</li> </ul>  |
| <b>Sanctuary Focus Areas</b>                | <ul style="list-style-type: none"> <li>• Ni‘ihau</li> <li>• Pīla‘a</li> <li>• Southern Maui Nui</li> <li>• Maunaloa</li> </ul>   |
| <b>Ensuring Management Effectiveness</b>    | <ul style="list-style-type: none"> <li>• Operational Foundation</li> <li>• Compliance and Enforcement</li> <li>• Emergency Preparedness and Damage Assessment</li> <li>• Assessing Progress</li> </ul> |

**Table 7. Sanctuary draft management plan structure.**

### 5.5.2. Regulations

Alternative 2 proposes a new name, new and revised sanctuary-wide regulations to apply across existing sanctuary area and proposed boundary additions, and Special Sanctuary Management Area regulations for the Penguin Bank and Maui Nui areas. The revised sanctuary wide-regulations are largely modeled off the current sanctuary-wide regulations with the following changes (1) the regulations prohibiting the take and possess of humpback whales would be combined; (2) the approach regulation would be clarified and articulated; (3) the prohibition against discharge would be removed; (4) the prohibition on altering submerged lands would be removed; and (5) authority to issue permits and authorizations would be added. Additionally, Alternative 2 proposes a new sanctuary-wide regulation prohibiting the disturbance of submerged cultural and maritime heritage resources. Alternative 2 proposes Special Sanctuary Management Area regulations for the Penguin Bank and Maui Nui areas (outside of 3 nautical miles). Special Sanctuary Management Area regulations would include prohibitions against: (1) taking or possessing additional marine species; (2) discharge; (3) altering submerged lands; (4) using explosives; (5) introducing non-native species; and (6) damaging or destroying signs.

#### 5.5.2.1. Name Change

Alternative 2 proposes a new sanctuary name: *Hawaiian Islands Humpback Whale National Marine Sanctuary - Nā Kai ‘Ewalu*. A name-change for the sanctuary would better reflect holistic thinking about the marine environment. In January 2012, the council established a

Sanctuary Naming Working Group to develop recommendations for a possible new name to replace the Hawaiian Islands Humpback Whale National Marine Sanctuary. The working group considered a range of potential names that communicated important aspects of a new management approach for the sanctuary, namely holistic management and a sense of community throughout Hawai‘i, with humans being a part of the larger ecosystem picture. The working group presented three names to the council who voted to forward all three names to the sanctuary manager.

Based on input from the council, the Office of National Marine Sanctuaries (ONMS) and the State of Hawai‘i, the new name was selected. The phrase “Nā Kai ‘Ewalu” means “the eight seas”. It is a reference to the channels between the populated Hawaiian Islands and a poetic reference to the Hawaiian Islands themselves. It illustrates the interconnectedness between the ocean and the people of Hawai‘i and their communities. Together these three words are referenced over 150 times in Hawaiian language newspapers. On several occasions, “Nā Kai ‘Ewalu” is written at the beginning of an article as a greeting from the author to the readers. This proposed new name of the sanctuary better reflects the move from single species management to ecosystem-based management.

#### **5.5.2.2. New and Revised Sanctuary-Wide Regulations**

Alternative 2 proposes the following revisions to the current sanctuary-wide regulations: (1) the regulations prohibiting the take and possess of humpback whales would be combined; (2) the approach regulation would be clarified and articulated; (3) the prohibition against discharge would be removed; (4) the prohibition on altering submerged lands would be removed; and (5) authority to issue permits and authorizations would be added. Additionally, Alternative 2 proposes a new sanctuary-wide regulation prohibiting the disturbance of submerged cultural and maritime heritage resources.

##### ***Action: Combine humpback whale take and possess regulations***

Alternative 2 proposes combining the regulations prohibiting the take and possession of humpback whales within the sanctuary into one regulation. Combining the regulations is consistent with humpback whale take and approach regulations under the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA) and the State of Hawai‘i. There would be no impact to the meaning or interpretation of the regulations by combining the language. Under current regulations, taking a humpback whale includes actions to harass, harm, pursue, hunt, wound, kill, trap, capture, collect or injure a humpback whale or protected species, or to attempt to engage in any such conduct. Furthermore, taking includes but is not limited to any of the following activities: collecting any dead or injured humpback whale or protected species, or any part thereof; restraining or detaining any humpback whale or protected species, or any part thereof, no matter how temporarily; tagging any humpback whale; operating a vessel or aircraft or doing any other act that results in the disturbing or molesting of any humpback whale or protected species.

##### ***Action: Clarify humpback whale approach regulation***

Under Alternative 2, the current regulation prohibiting approaching humpback whales (922.184 (a)(1)) would be clarified to include additional regulatory language. The revised regulation

would prohibit interception, or placing a vessel in the path of an oncoming humpback whale so that the whale surfaces within 100 yards (91.4 m) of the vessel. Additionally, it would be prohibited to disrupt the normal behavior or prior activity of a whale by any other act or omission. Exceptions would be recognized for permits issued under the NOAA Fisheries, as well as for state, local, or federal government vessels operating in the course of official duty, and vessels otherwise restricted.

***Action: Remove existing prohibitions on disturbance of submerged lands and discharge***

Alternative 2 proposes removing the current regulation prohibiting discharge into the sanctuary (from either inside or outside the sanctuary) and prohibiting altering the seabed. The current regulation is tied to existing management authorities over these activities (discharge and disturbing the seabed) and violation of any user group in regards to these authorities' permit requirements and/or permit conditions.

***Action: Add prohibition on disturbance of cultural and maritime heritage resources***

Alternative 2 proposes a new regulation to prohibit removing, damaging, or tampering with any historical or cultural resource anywhere in the sanctuary.

***Action: Add authority to issue sanctuary permits and authorizations***

Alternative 2 proposes to add the authority for the ONMS Director (delegated to the sanctuary superintendent) to issue general permits, authorizations and special use permits for the sanctuary. The regulations would specify that general permits could be issued for management, research, education purposes for activities that would otherwise violate regulations that prohibit discharge, altering submerged lands, and disturbing cultural and maritime heritage resources. An additional sanctuary-specific general permit category would also be added for the installation of submarine cables. In addition, the regulations would propose a specific review criterion for the installation of submarine cables general permit category, which would require that the proposed cable installation be approved by the State of Hawaii for state waters of the sanctuary in order to be eligible for permit approval by ONMS. Alternative 2 would add the authority to authorize other federal, state, or local permits. This alternative would also add the authority to issue special use permits, as described in section 310 of the NMSA.

### **5.5.2.3. Special Sanctuary Management Area Regulations**

Alternative 2 proposes Special Sanctuary Management Area regulations for the Penguin Bank and Maui Nui areas (outside of 3 nautical miles). Special Sanctuary Management Area regulations would include prohibitions against: (1) taking or possessing additional marine species; (2) discharge; (3) altering submerged lands; (4) using explosives; (5) introducing non-native species; and (6) damaging or destroying signs. Maui Nui is a unique, semi-enclosed, shallow protected sea bound by the islands of Maui, Moloka'i, Lāna'i, and Kaho'olawe. The Maui Nui area refers to the adjoining submerged base of the mountain that used to connect Maui, Lāna'i, and Moloka'i and ranges to depths more than 262 feet (80 m).

***Action: Add prohibition on take or possess of additional marine species***

Under Alternative 2, the regulation prohibiting taking and possessing of humpback whales would be expanded to also prohibit taking or possessing marine mammals, sea turtles, seabirds, ESA-listed species or Hawai‘i Revised Statutes chapter 195D listed species. The sanctuary would recognize any activities that are exempted under the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), the Magnuson Stevens Fishery Conservation and Management Act, or Hawai‘i State Law. The sanctuary could authorize other state and federal permits.

***Action: Add new prohibition on discharges***

Under Alternative 2, it would be prohibited to discharge or deposit any material or other matter into the Penguin Bank and Maui Nui areas, which is located in federal waters, outside of 3 nautical miles from shore. Exceptions would be made for fish, fish parts, chumming materials or bait used for fishing, biodegradable effluents incidental to vessel use, water generated by routine vessel operations, and material deposited for ceremonial purposes. Additionally, it would be prohibited to discharge or deposit any material or matter outside the sanctuary that subsequently enters the Penguin Bank and Maui Nui areas and injures a resource within the area. Under this alternative, sanctuary management could issue permits for research, education, and management. They could also authorize other state and federal permits for activities that would violate this regulation, provided it met permit criteria.

***Action: Add new prohibition on disturbance of the submerged lands***

Dredging, drilling into, or otherwise altering in any way the submerged lands (including bottom formations, live rock and coral) would be prohibited within the Penguin Bank and Maui Nui areas (federal waters outside of 3 nautical miles) under Alternative 2. Anchoring a vessel on sandy bottom or substrate other than live rock or coral would be permitted, as would routine maintenance, ecological maintenance and navigation. Legal fishing activities permitted under NOAA Fisheries would be allowed. Additionally, aquaculture activities authorized under state and federal permits would be permitted. Under this alternative, sanctuary management could issue permits for research, education, and management and sanctuary management could authorize other state and federal permits for activities that would violate this regulation, provided it met permit criteria.

***Action: Add new prohibition on use of explosives***

Alternative 4 would prohibit possessing, or using explosives within the Penguin Bank and Maui Nui areas (federal waters outside of 3 nautical miles) except for valid law enforcement purposes or under a valid permit.

***Action: Add new prohibition on introduction of introduced species***

Alternative 4 would prohibit introducing or otherwise releasing an introduced species within or into the Penguin Bank and Maui Nui areas (federal waters outside of 3 nautical miles). Exceptions would be made for species cultivated by mariculture activities in federal waters pursuant to a valid lease, permit, license or other authorization issued by the National Marine Fisheries Service in effect on the effective date of the final regulation.

***Action: Add new prohibition on damaging and destroying signs***

Under Alternative 4, it would be illegal to mark, deface or damage any signs, notices, or placards, whether temporary or permanent, or with any monuments, stakes, posts, or other boundary markers related to Penguin Bank and the Maui Nui area.

**5.5.3. Boundary Changes**

Alternative 2 proposes boundary changes on the north shore of O‘ahu and the north shore of Kaua‘i, extending the boundary around the ledges on the south end of Penguin Bank, as well as establishing new sanctuary boundaries around Ni‘ihau. A range of boundary changes were proposed during the public comment period. A full description of the geography and major attributes of the proposed sites is described in the Affected Environment (Section 7). The Affected Environment also describes the current human uses, management regimes, and threats to resources. The justification for including these areas in the sanctuary, as well as a description of the proposed impact to the biological and human environment, is included in the Environmental Consequences (Section 9).

### 5.5.3.1. Ni‘ihau

Alternative 2 proposes to incorporate the waters around the island of Ni‘ihau into the sanctuary (Figure 4). The sanctuary does not currently manage the marine environment around Ni‘ihau. The proposed boundary would extend out three nautical miles to be consistent with state waters. The sanctuary would allow managers to collect user information around Ni‘ihau. The total area of the proposed boundary expansion would be approximately 217 square miles.

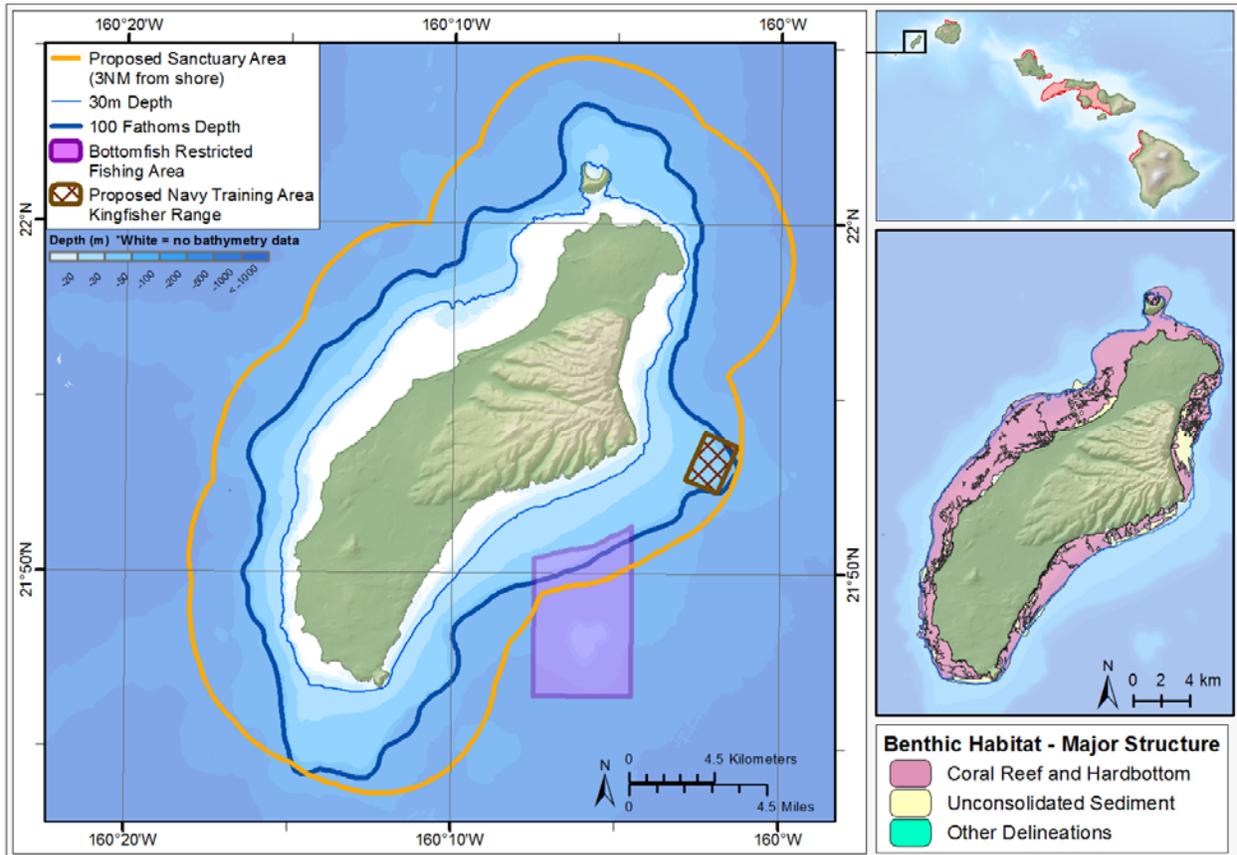


Figure 4. Proposed boundary expansion around Ni‘ihau.

### 5.5.3.2. Kaua‘i: Hā‘ena Ahupua‘a

The current sanctuary boundary on the north shore of Kaua‘i extends from Kailiu Point eastward to Mokolea Point out to the 100-fathom (183 m) isobath. The western boundary of the sanctuary on the north shore of Kaua‘i intersects the Hā‘ena ahupua‘a just over one mile east of the western boundary of the ahupua‘a (Figure 5). Under Alternative 2, the sanctuary proposes to extend the western boundary of the sanctuary to Ke‘e Beach to include the full Hā‘ena ahupua‘a. By integrating this traditional land division into sanctuary management, the sanctuary is recognizing the natural contours of the land and the interrelationship between land and sea to effectively manage resources from the ridge to the reef. Extending the sanctuary boundary to align with the ahupua‘a boundary would establish a precedent for future sanctuary boundary changes. Since the original sanctuary boundaries were established to protect humpback whales and their habitat, only some of the current sanctuary boundaries currently align with traditional ahupua‘a boundaries. The boundary adjustment would also make the sanctuary consistent with the boundary of the Hā‘ena community-based subsistence fishing area (CBSFA). The total area of the proposed boundary expansion would be approximately 8 square miles.

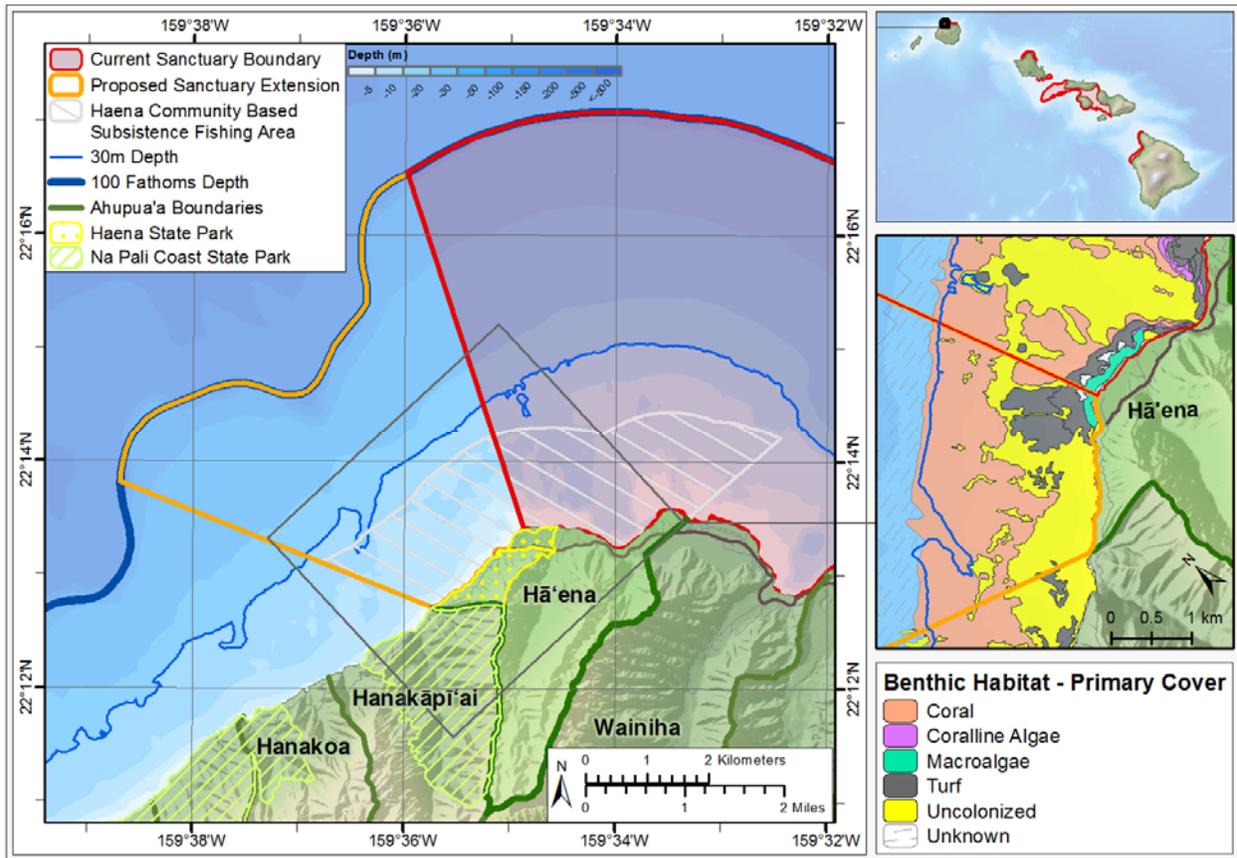


Figure 5. Proposed boundary adjustment in Hā‘ena.

### 5.5.3.3. Kaua‘i: Pīla‘a Ahupua‘a

The current sanctuary boundary on the north shore of Kaua‘i extends from Kailiu Point eastward to Mokolea Point out to the 100-fathom (183 m) isobath. Alternative 2 proposes to adjust the eastern-boundary of the sanctuary on the north shore of Kaua‘i from Mokolea Point to Kepuhi Point to include Kāhili, West Waiakalua, East Waiakalua and Pīla‘a ahupua‘a (Figure 6). The total area of the proposed boundary expansion would be approximately 5 square miles. The proposed sanctuary area would be used to pilot traditional marine management approaches along with science-informed management to restore the degraded coral reef ecosystem.

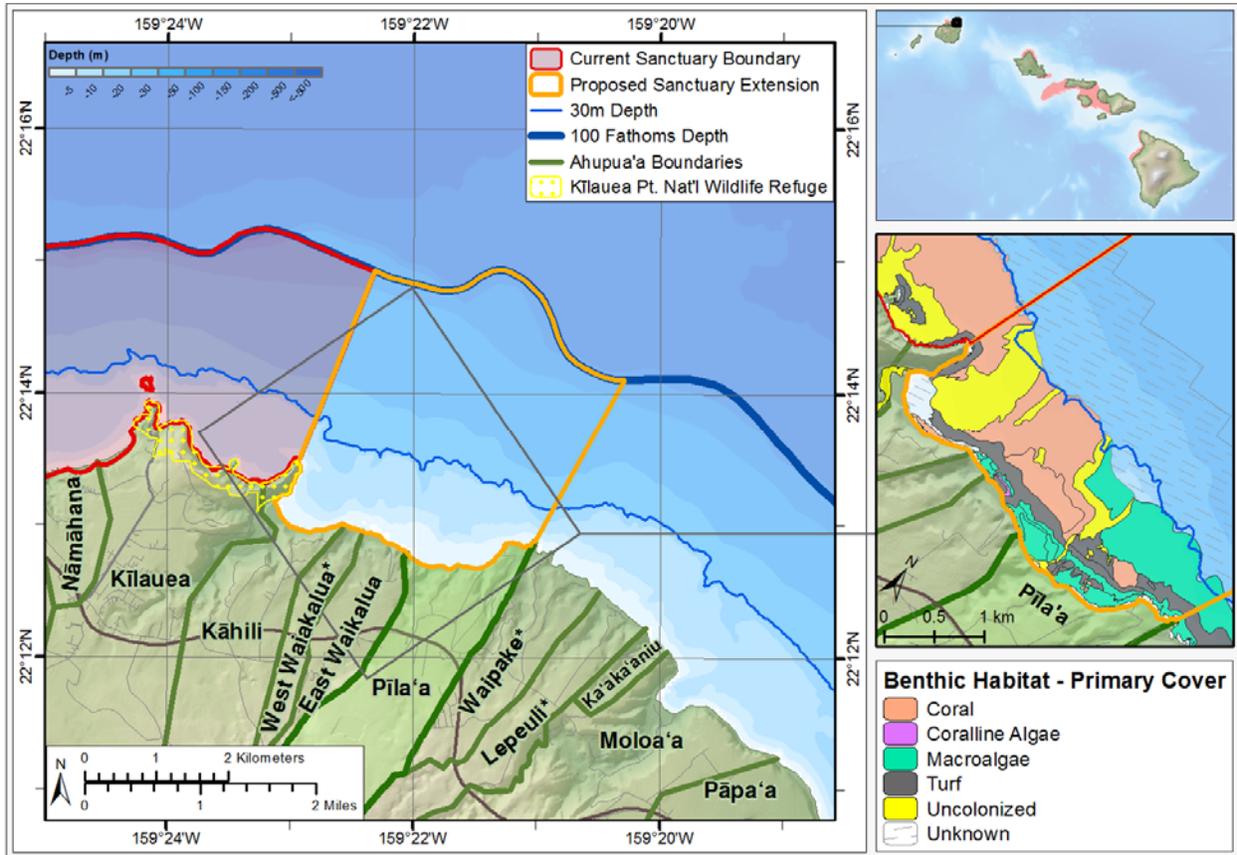


Figure 6. Proposed boundary adjustment at Pīla‘a.

### 5.5.3.4. O‘ahu

The current sanctuary boundary on the north shore of O‘ahu extends from Pua‘ena Point eastward to Māhie Point, out to the 100-fathom (183 m) isobath (Figure 7). Under Alternative 2, the sanctuary proposes to adjust the western boundary of the sanctuary to Ali‘i Beach Park, out to 100-fathom isobath to be consistent with the boundary of the North Shore Surfing Reserve established under Executive Order 10-07. The Surfing Reserve was part of an effort to acknowledge the cultural and historic significance of important surf sites in Hawai‘i. The proposed sanctuary boundary adjustment would exclude Hale‘iwa Harbor. The total area of the proposed boundary expansion would be approximately 4 square miles.

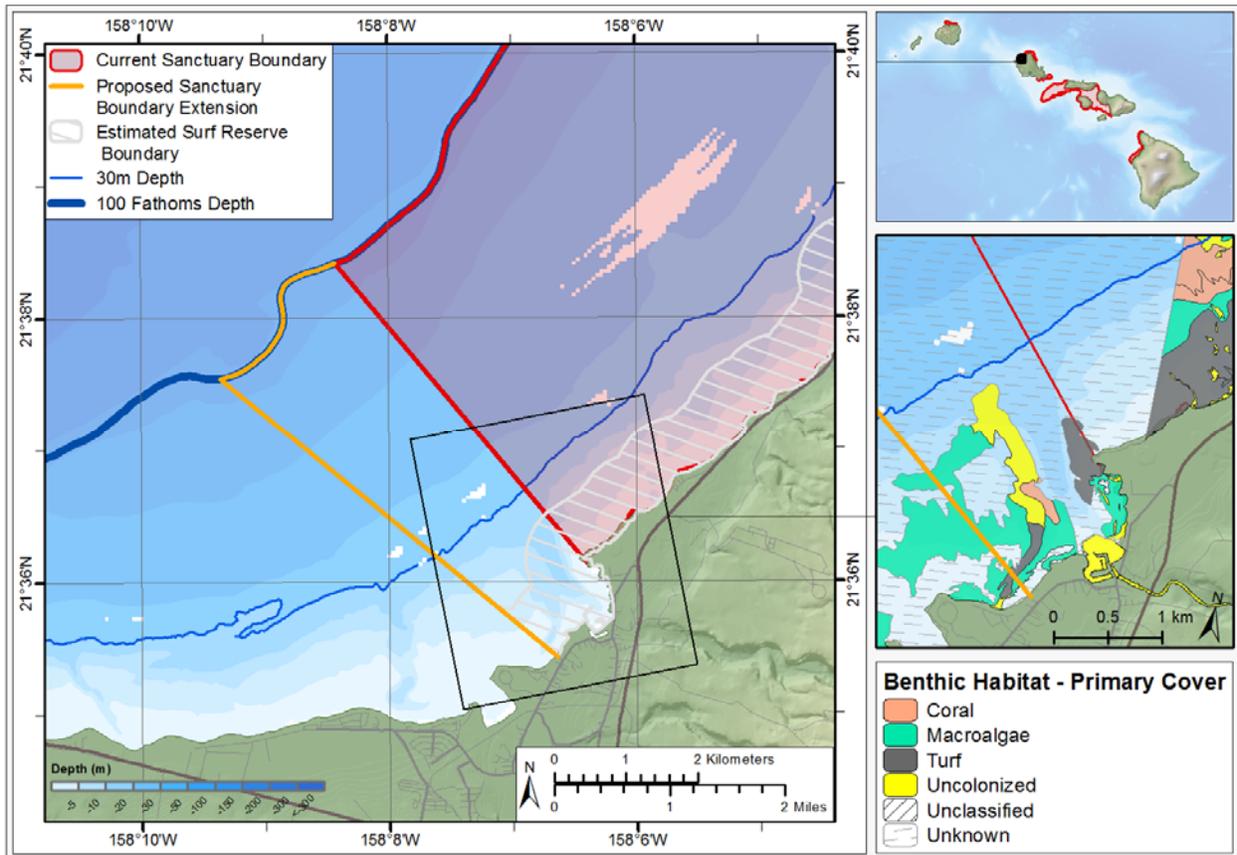


Figure 7. Proposed boundary adjustment on O‘ahu.

### 5.5.3.5. Penguin Bank

The current sanctuary boundary approximates the 100-fathom (183 m) isobath around Penguin Bank. Under Alternative 2, the sanctuary proposes extending the boundary around the ledges on the south end of Penguin Bank (Figure 8). The boundary adjustment will facilitate enforcement efforts and clarify boundaries for ocean users. The total area of the proposed boundary expansion would be approximately 21 square miles.

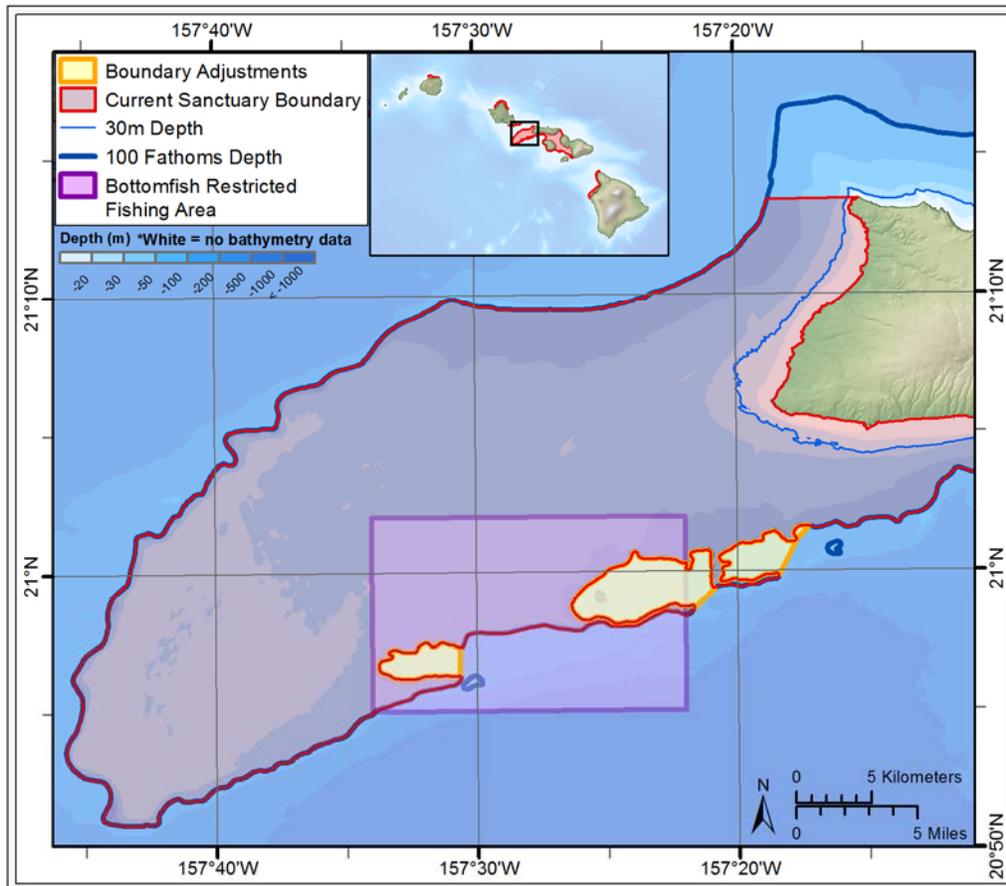


Figure 8. Proposed boundary adjustment to Penguin Bank.

## **5.6. Alternative 3: Proposed Action**

### **5.6.1. Revised Management Plan**

Alternative 3 proposes the same revised management plan as proposed in Alternative 2 as a way to coordinate a transition from a single species management approach to an ecosystem-based management approach. The revised management plan would replace the 2002 Management Plan as the basis for sanctuary operations.

### **5.6.2. Regulations**

#### **5.6.2.1. Name Change**

The new sanctuary name proposed under Alternative 2 would also be proposed under alternative 3: *Hawaiian Islands National Marine Sanctuary - Nā Kai 'Ewalu*.

#### **5.6.2.2. New and Revised Sanctuary-Wide Regulations**

The revisions to the current sanctuary-wide regulations proposed under Alternative 2 would also apply under Alternative 3 including: (1) the regulations prohibiting the take and possess of humpback whales would be combined; (2) the approach regulation would be clarified and articulated; (3) the prohibition against discharge would be removed; (4) the prohibition on altering submerged lands would be removed; and (5) authority to issue permits and authorizations would be added. The new sanctuary-wide regulation prohibiting the disturbance of submerged cultural and maritime heritage resources proposed under Alternative 2 will also apply under Alternative 3. The new and revised sanctuary-wide regulations proposed in Alternative 3 are the same as those proposed in Alternative 2.

#### **5.6.2.3. Special Sanctuary Management Area Regulations**

The Sanctuary Management Area regulations proposed in Alternative 2 for Maui Nui and Penguin Bank would apply to Maunalua Bay in addition to Maui Nui and Penguin Bank under Alternative 3 (Figure 9). These regulations include prohibitions against: (1) taking or possessing additional marine species; (2) discharge; (3) altering submerged lands; (4) using explosives; (5) introducing non-native species; and (6) damaging or destroying signs. Applying these proposed Special Sanctuary Management Area regulations to Maunalua Bay is the only difference between Alternatives 2 and 3.

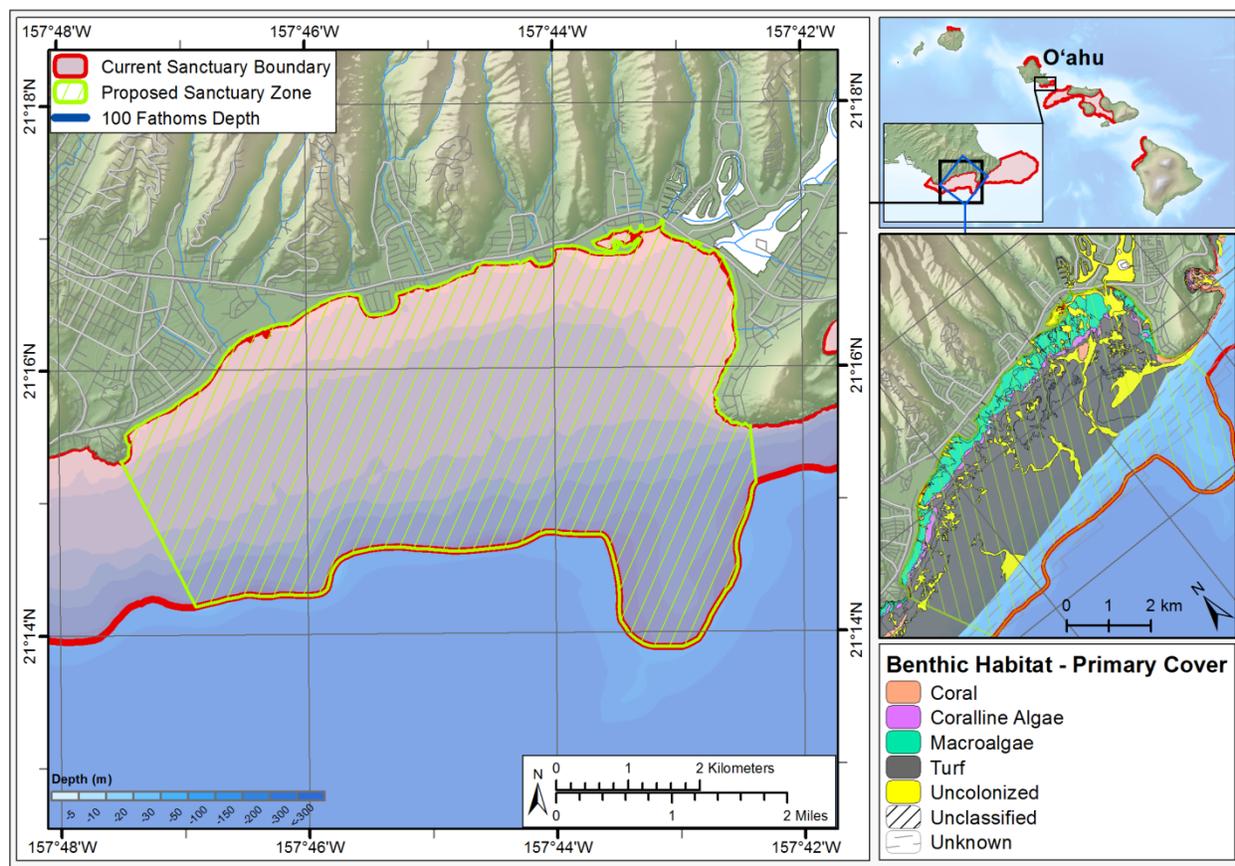


Figure 9. Proposed regulatory area for Maunaloa Bay Special Sanctuary Management Area.

### 5.6.3. Boundary Changes

The proposed boundary changes on O’ahu, Kaua’i, Penguin Bank and Ni’ihau described under Alternative 2 are also proposed under Alternative 3. A full description of the geography and major attributes of the proposed sites is described in the Affected Environment (Section 7). The Affected Environment also describes the current human uses, management regimes, and threats to resources. The justification for including these areas into the sanctuary, as well as a description of the proposed impact to the biological and human environment, is included in the Environmental Consequences (Section 9).

## **5.7. Alternative 4**

### **5.7.1. Revised Management Plan**

Alternative 4 proposes the same revised management plan as proposed in Alternative 2 as a way to coordinate a transition from a single species management approach to an ecosystem-based management approach. The revised management plan would replace the 2002 Management Plan as the basis for sanctuary operations.

### **5.7.2. Regulations**

#### **5.7.2.1. Name Change**

The new sanctuary name proposed under Alternative 2 would also be proposed under alternative 4: *Hawaiian Islands National Marine Sanctuary - Nā Kai 'Ewalu*.

#### **5.7.2.2. New and Revised Sanctuary-Wide Regulations**

Alternative 4 proposes to apply sanctuary-wide prohibitions against: (1) taking or possessing additional marine species; (2) discharge; (3) altering submerged lands; (4) using explosives; (5) introducing non-native species; and (6) damaging or destroying signs. In Alternatives 2 and 3, these regulations would only apply to Special Sanctuary Management Areas. In Alternative 4, these regulations would apply to the entire sanctuary. The revisions to the current sanctuary-wide regulations proposed under Alternative 2 would also apply under Alternative 4 including: (1) the regulations prohibiting the take and possess of humpback whales would be combined; (2) the approach regulation would be clarified and articulated; (3) the prohibition against discharge would be removed; (4) the prohibition on altering submerged lands would be removed; and (5) authority to issue permits and authorizations would be added. The new sanctuary-wide regulation prohibiting the disturbance of submerged cultural and maritime heritage resources proposed under Alternative 2 will also apply under Alternative 4.

### **5.7.3. Boundary Changes**

The proposed boundary changes on O'ahu, Kaua'i, Penguin Bank and Ni'ihau described under Alternative 2 are also proposed under Alternative 4. In addition, Alternative 4 proposes to incorporate the estuarine waters of the Hanalei River into the sanctuary on the north shore of Kaua'i. A full description of the geography and major attributes of the proposed sites is described in the Affected Environment (Section 7). The Affected Environment also describes the current human uses, management regimes, and threats to resources. The justification for including these areas into the sanctuary, as well as a description of the proposed impact to the biological and human environment, is included in the Environmental Consequences (Section 9).

### 5.7.3.1. Kaua‘i: Hanalei River

The current sanctuary boundary consists of the submerged lands and waters seaward from the shoreline, cutting across the mouths of rivers and streams. Under Alternative 4, the sanctuary proposes to incorporate the estuarine waters of the Hanalei River into the sanctuary on the north shore of Kaua‘i. Currently the U.S. Fish and Wildlife Service (USFWS) manages the Hanalei National Wildlife Refuge (NWR) which includes the upper Hanalei River (Figure 10). The sanctuary boundary would extend up the river approximately 1.5 miles so the boundary would be adjacent to the Hanalei NWR boundary (partial extent of salt water intrusion range). The proposed boundary adjustment would ensure that activity upstream does not impact marine resources in Hanalei Bay including the Hanalei River.

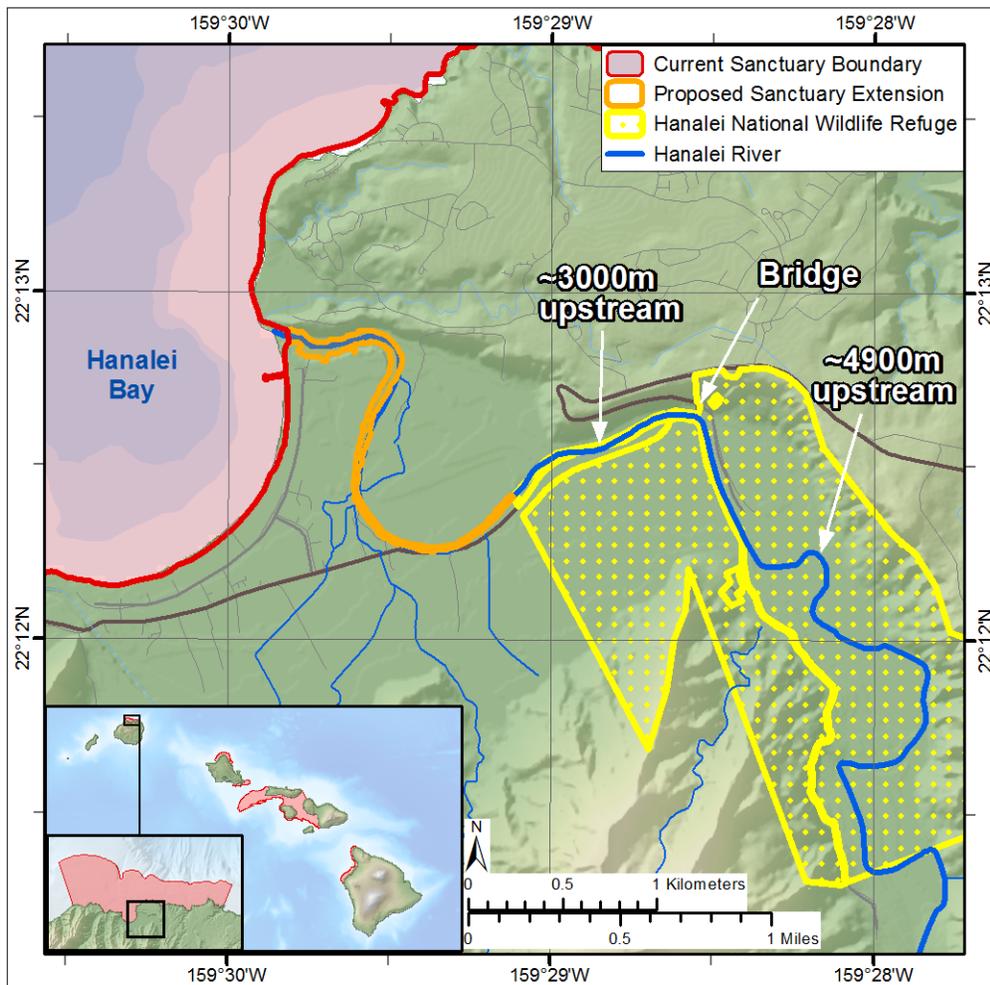


Figure 10. Proposed boundary adjustment for Hanalei River.

### 5.7.4. Comparison of Alternatives

In general, each subsequent alternative broadens the proposed regulatory area expands boundaries of the sanctuary to protect sanctuary resources. Table 8 summarizes the actions proposed under each of the four alternatives. The proposed action is Alternative 3.

| Alternative      | Boundary changes   | Regulations                        |                                |   |
|------------------|--|------------------------------------|--------------------------------|---|
|                  |  | Revised Sanctuary-Wide Regulations | New Sanctuary-Wide Regulations | Special Sanctuary Management Area Regulations |
| 1                | <i>Status Quo – none of the above boundary changes or regulations apply.</i> |                                    |                                |   |
| 2                | Ni’ihau  | Sanctuary-wide                     | Sanctuary-wide                 | Penguin Bank/ Maui Nui                        |
|                  | North Shore, O’ahu   |                                    |                                |   |
|                  | Ha’ena, Kaua’i   |                                    |                                |   |
|                  | Pi’la’a, Kaua’i  |                                    |                                |   |
|                  | Penguin Bank   |                                    |                                |   |
| 3<br>(Preferred) | Ni’ihau  | Sanctuary-wide                     | Sanctuary-wide                 | Penguin Bank/ Maui Nui and Maunalua           |
|                  | North Shore, O’ahu   |                                    |                                |   |
|                  | Ha’ena, Kaua’i   |                                    |                                |   |
|                  | Pi’la’a, Kaua’i  |                                    |                                |   |
|                  | Penguin Bank   |                                    |                                |   |
| 4                | Ni’ihau  | Sanctuary-wide                     | Sanctuary-wide                 | Sanctuary-wide                                |
|                  | North Shore O’ahu  |                                    |                                |   |
|                  | Ha’ena, Kaua’i   |                                    |                                |   |
|                  | Pi’la’a, Kaua’i  |                                    |                                |   |
|                  | Penguin Bank   |                                    |                                |   |
|                  | Hanalei, Kaua’i  |                                    |                                |   |

**Table 8. Comparison of Alternatives in the DEIS.**

Table 9 summarizes the proposed regulations under each of the four alternatives. Regulations in light blue are the current regulations that apply sanctuary-wide. Alternative 1 does not propose any changes to the current sanctuary regulations. Alternative 2 proposes changes to the existing sanctuary-wide regulations and proposes additional regulations for the Special Sanctuary Management Areas at Penguin Bank and Maui Nui. Alternative 3 proposes to extend the Special Sanctuary Management Area regulations to Maunalua Bay. Alternative 4 proposes sanctuary-wide regulations to protect sanctuary resources.

| Regulations    |  | Alternative |   |   |   |
|----------------|--|-------------|---|---|---|
|                |  | 1           | 2 | 3 | 4 |
| Description    |  | 1           | 2 | 3 | 4 |
| Approach       | Approaching, or causing a vessel or other object to approach within 100 yards of any humpback whale.   | ✓           |   |   |   |
|                | Approaching a humpback whale within 100 yards of any humpback whale by any means including by interception, causing a vessel or other object to approach a humpback whale, or disrupting the normal behavior or prior activity of a whale by any other act or omission.                  |             | ✓ | ✓ | ✓ |
| Overflight     | Operating an aircraft above the Sanctuary within 1,000 feet of any humpback whale.   | ✓           | ✓ | ✓ | ✓ |
| Take & Possess | Taking any humpback whale.   | ✓           |   |   |   |
|                | Possessing any living or dead humpback whale.  | ✓           |   |   |   |
|                | Taking or possessing any humpback whales within the Sanctuary.   |             | ✓ | ✓ | * |
|                | Taking or possessing any marine mammal, sea turtle, seabird, Endangered Species Act-listed species or Hawai'i Revised Statutes chapter 195D listed species, within or above the Special Sanctuary Management Areas (Penguin Bank, Maui Nui Area).  |             | ✓ |   |   |
|                | Taking or possessing any marine mammal, sea turtle, seabird, Endangered Species Act-listed species or Hawai'i Revised Statutes chapter 195D listed species, within or above the Special Sanctuary Management Areas ((Penguin Bank, Maui Nui Area, and Maunalua Bay).                     |             |   | ✓ |   |
|                | Taking or possessing any marine mammal, sea turtle, seabird, Endangered Species Act-listed species or Hawai'i Revised Statutes chapter 195D listed species, within or above the Sanctuary.   |             |   |   | ✓ |
| Discharge      | Discharging or depositing any material or other matter in the sanctuary that injures a humpback whale or humpback whale habitat without a permit, license, lease, or other authorization from another agency.  | ✓           |   |   |   |
|                | Discharging or depositing any material or other matter in the Special Sanctuary Management Areas (Penguin Bank and Maui Nui area).   |             | ✓ |   |   |
|                | Discharging or depositing any material or other matter in the Special Sanctuary Management Areas (Penguin Bank, Maui Nui area and Maunalua Bay).   |             |   | ✓ |   |
|                | Discharging or depositing any material or other matter in the Sanctuary.   |             |   |   | ✓ |
| Enter & Injure | Discharging or depositing any material or other matter outside of the sanctuary if the discharge or deposit subsequently enters and injures a humpback whale or humpback whale habitat without a permit, license, lease, or other authorization from another agency.                     | ✓           |   |   |   |
|                | Discharging or depositing any material or other matter outside of the Special Sanctuary Management Areas if the discharge or deposit subsequently enters and injures a sanctuary resource within the Special Sanctuary Management Areas (Penguin Bank and Maui Nui Area).                |             | ✓ |   |   |
|                | Discharging or depositing any material or other matter outside of the Special Sanctuary Management Areas if the discharge or deposit subsequently enters and injures a sanctuary resource within the Special Sanctuary Management Areas (Penguin Bank, Maui Nui Area, and Maunalua Bay). |             |   | ✓ |   |
|                | Discharging or depositing any material or other matter outside of the Special Sanctuary Management Areas if the discharge or deposit subsequently enters and injures a sanctuary resource within the Sanctuary.  |             |   |   | ✓ |

|                          |  |   |   |   |   |
|--------------------------|--|---|---|---|---|
| Altering Submerged Lands | Altering the seabed of the Sanctuary without a permit, license, or authorization.  | ✓ |   |   |   |
|                          | Dredging, drilling into, or otherwise altering in any way the submerged lands (including natural bottom formations, live rock and coral) within the Special Sanctuary Management Areas (Penguin Bank and Maui Nui area).   |   | ✓ |   |   |
|                          | Dredging, drilling into, or otherwise altering in any way the submerged lands (including natural bottom formations, live rock and coral) within the Special Sanctuary Management Areas (Penguin Bank, Maui Nui area, and Maunalua Bay).  |   |   | ✓ |   |
|                          | Dredging, drilling into, or otherwise altering in any way the submerged lands (including natural bottom formations, live rock and coral) within the Sanctuary.   |   |   |   | ✓ |
| Explosives               | Possessing or using explosives within the Special Sanctuary Management Areas, except for valid law enforcement purposes (Penguin Bank and Maui Nui area).  |   | ✓ |   |   |
|                          | Possessing or using explosives within the Special Sanctuary Management Areas, except for valid law enforcement purposes (Penguin Bank, Maui Nui area, and Maunalua Bay).   |   |   | ✓ |   |
|                          | Possessing or using explosives within the Sanctuary, except for valid law enforcement purposes   |   |   |   | ✓ |
| Introduced Species       | Introducing or otherwise releasing from within or into the Special Sanctuary Management Areas (Penguin Bank and Maui Nui area) an introduced species.  |   | ✓ |   |   |
|                          | Introducing or otherwise releasing from within or into the Special Sanctuary Management Areas (Penguin Bank, Maui Nui area, and Maunalua Bay) an introduced species.   |   |   | ✓ |   |
|                          | Introducing or otherwise releasing from within or into the Sanctuary an introduced species.  |   |   |   | ✓ |
| Historical & Cultural    | Removing, damaging, or tampering with any historical or cultural resource within the Sanctuary.  |   | ✓ | ✓ | ✓ |
| Signage                  | Marking, defacing, or damaging in any way, or displacing or removing or tampering with any signs, notices, or placards, whether temporary or permanent, or with any monuments, stakes, posts, or other boundary markers related to the Sanctuary including boundary markers related to the Special Sanctuary Management Areas (Penguin Bank and Maui Nui area).                |   | ✓ |   |   |
|                          | Marking, defacing, or damaging in any way, or displacing or removing or tampering with any signs, notices, or placards, whether temporary or permanent, or with any monuments, stakes, posts, or other boundary markers related to the Sanctuary including boundary markers related to the Special Sanctuary Management Areas (Penguin Bank, Maui Nui area, and Maunalua Bay). |   |   | ✓ |   |
|                          | Marking, defacing, or damaging in any way, or displacing or removing or tampering with any signs, notices, or placards, whether temporary or permanent, or with any monuments, stakes, posts, or other boundary markers related to the Sanctuary including boundary markers related to the Sanctuary.  |   |   |   | ✓ |
| Enforcement              | Interfering with, obstructing, delaying or preventing an investigation, search, seizure or disposition of seized property in connection with enforcement of either of the Acts or any regulations issued under either of the Acts.   | ✓ | ✓ | ✓ | ✓ |

Table 9. Summary of proposed regulations by Alternative.

## 6. Site Description

### 6.1. Geography

The Hawaiian Archipelago is a group of eight inhabited islands together with 124 islets (some of which are unrelated to the archipelago), shoals, and reefs stretching about 1,490 nautical miles along a southeast-northwest axis in the North Central Pacific. The State of Hawai‘i consists of 6,471 square miles of land, ranges in elevation from sea level to 13,796 feet at the peak of Mauna Kea on the island of Hawai‘i, and has 750 miles of coastline with 40 square miles of estuaries, harbors, and bays. Lying in the Tropic of Cancer between 154°40' to 178°75' W longitude and 18°40' to 28°25' N latitude, the inhabited islands in order of size are Hawai‘i, Maui, O‘ahu, Kaua‘i, Moloka‘i, Lāna‘i, Ni‘ihau, and Kaho‘olawe. The major ocean and interisland channels of the inhabited islands are shown in Figure 11. The inhabited islands are the youngest of the Hawaiian Archipelago and comprise approximately 4,845 square miles (12,548 square km) of land and 889 miles (1,431 km) of coastline.

| Island     | Size (sq mi) | Shoreline (miles) | Max Elevation (ft)                | Latitude/ Longitude | Special Features   |
|------------|--------------|-------------------|-----------------------------------|---------------------|--|
| Ni‘ihau    | 70           | 90                | 1,250<br>Mt. Pānī‘au              | 21°54'N<br>160°10'W | 7th largest; mostly private, limited public access                       |
| Kaua‘i     | 562          | 136               | 5,243<br>Kawaikini                | 22°05'N<br>159°30'W | 4th largest; Waimea Canyon; "Barking Sands" Pacific Missile Range        |
| O‘ahu      | 597          | 112               | 4,003<br>Mt. Ka‘ala               | 21°28'N<br>157°59'W | 3rd largest; most populous island; Waianae & Ko‘olau mountain ranges     |
| Maui       | 727          | 86                | 10,238 Haleakalā                  | 20°48'N<br>156°20'W | 2nd largest; wintering area for humpbacks in ‘Au‘au Channel              |
| Moloka‘i   | 206          | 88                | 4961 Kamakou                      | 21°08'N<br>157°02'W | 5th largest  |
| Lāna‘i     | 141          | 121               | 3,366 Lānaihale                   | 20°50'N<br>156°56'W | 6th largest  |
| Kaho‘olawe | 45           | 30                | 1,438 Pu‘u Moaulanui [Lua Makika] | 20°33'N<br>156°36'W | 8th largest; Kaho‘olawe Island Reserve; commercial uses prohibited       |
| Hawai‘i    | 4028         | 266               | 13,796 Mauna Kea                  | 19°34'N<br>155°30'W | Largest island; Great Crack 9.8 mi deep fissure; active volcano, Kilauea |

**Table 10. Key physical attributes of the populated Hawaiian Islands.**

Source: Coastal Geology Group (2011) <http://www.soest.Hawai‘i.edu/coasts/data/>

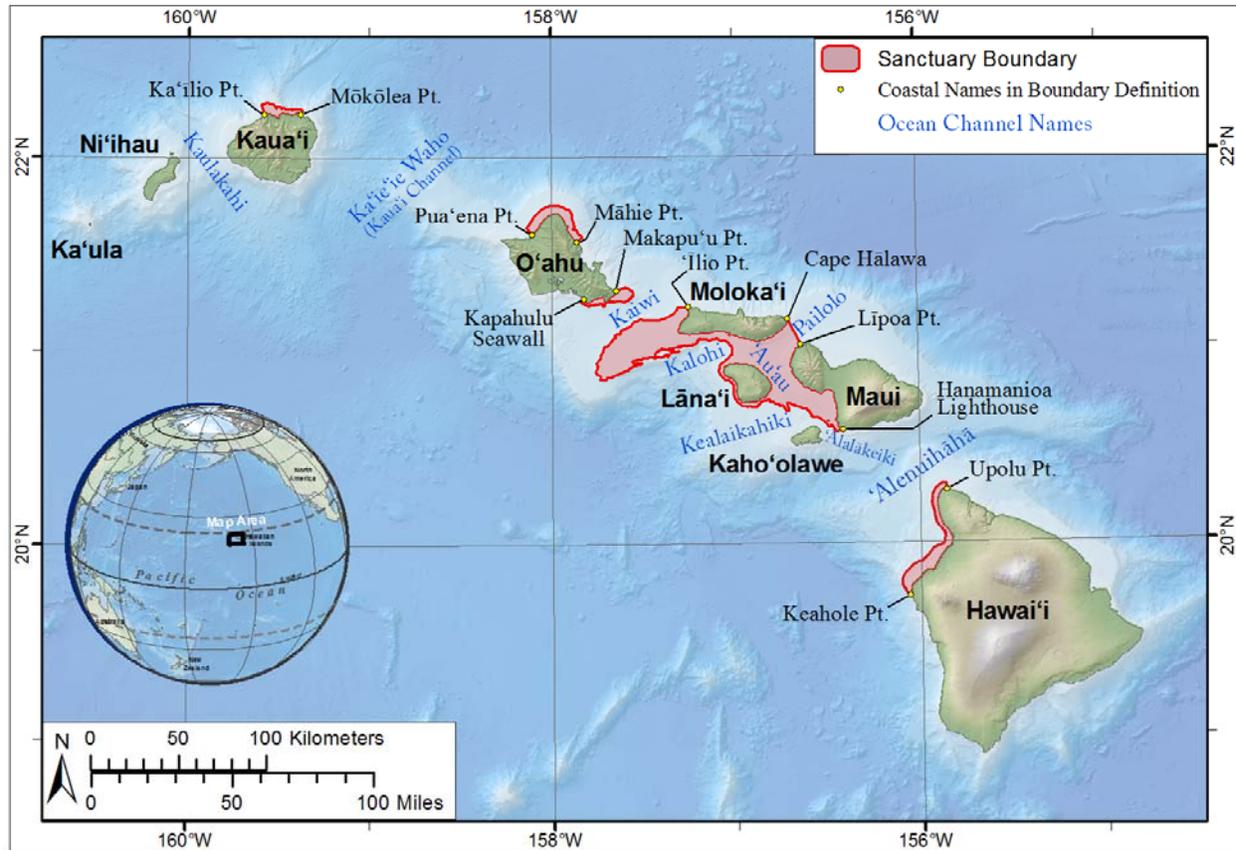


Figure 11. Sanctuary boundary and major channels.

Source: *Hawaiian Islands Humpback Whale National Marine Sanctuary 2013*.

## 6.2. Geology

The populated Hawaiian Islands were formed during the last few million years by the gradual accretion of basaltic lava flows. Their geologic features have been formed by successive periods of volcanic activity interspersed with submergence, weathering, and fluctuations in sea level. The volcanic activity that created the Hawaiian Islands formed comparatively gradual mountain masses that rise abruptly from the relatively smooth archipelagic apron of the adjacent sea floor. This apron extends a few tens of kilometers outward from the islands slopes slightly upward from the base of the islands at 4,375-5,468 yards (4,000-5,000m) deep. The sea floor at the base of the islands is slightly depressed and forms a moat-type structure around the islands. Beyond the moat is a bulge or arch, apparently formed by the weight of the islands pushing the displaced material outward (Menard 1964).

The islands generally are surrounded by coral reefs and contain numerous bays. Along some of the windward shorelines where perennial streams empty into the ocean, estuarine-like conditions prevail. Relatively abundant rainfall and persistent northeasterly trade winds contribute to the steady weathering of the islands. Sandy beaches are found along the shorelines of all the islands but are best developed on Kaua'i and Ni'ihau and least developed on Hawai'i, where mountain-building and shoreline creation is still occurring (Aki et al. 1994).

### 6.3. Geomorphology/Bathymetry

The islands of Maui, Lānaʻi, Molokaʻi, and Kahoʻolawe are the remnants of a single massive volcanic conglomerate. In the past, these four islands were connected to form a single island called "Maui Nui" (Stearns and Macdonald 1942). In 2004, Price & Elliott-Fisk published a model that estimated timing, duration, and topographic attributes of different island configurations for Maui Nui over time. The Maui Nui island reached its largest areal extent around 1.2 million years ago when it was larger than the current island of Hawaiʻi (Price and Elliott-Fisk 2004). Maui Nui spent approximately 75% of its history as a single large landmass. This landscape history is important to the biogeographic patterns of organisms on and near the current Maui Nui islands (Price and Elliott-Fisk 2004). The adjoining submerged base of Maui, Lānaʻi, and Molokaʻi ranges to depths more than 260 feet (80 m).

The average depth of water over Penguin Bank is about 200 feet (60 m), but ranges from 150-650 feet (50-200 m). The bathymetry of the area, bound by Maui, Molokaʻi, Lānaʻi, and Kahoʻolawe, along with the extension of the shallow Penguin Bank southwest of Molokaʻi, represents a unique, semi-enclosed, shallow protected sea in the midst of an expansive ocean. As recently as the last glacial maximum (20,000-21,000 years ago), Penguin Bank was above sea level as part of a large "Maui Nui" island (Price and Elliott-Fisk 2004).

The nearshore topography of Oʻahu is characterized by a series of marine terraces. The terraces, which are separated by escarpments, reflect periods of emergence, submergence, and changes in sea level. The upper level terrace extends seaward to about 200 feet (60 m) followed by a steep escarpment and then a second or intermediate terrace from about 225 to 400 feet (70 m to 120 m). Another steep escarpment is found at this depth and then a gently sloping terrace extends from about 425 to 2000 feet (130 m to the 600 m) contour (Brock and Chamberlain 1968). Sonic depth recorders indicate a relatively flat or gently sloping bottom at depths near 650 feet (200 m) (100-fathom isobaths) (EPA 1980). With few exceptions, the bottom topography from 0.2 miles (0.3 km) seaward is very steep and drops almost immediately to the abyssal plains at 3 miles (4.8 km).

### 6.4. Oceanography

Centered at about 28° N, ocean currents form a large clockwise circulation called a gyre. At the latitudes around the islands of Hawaiʻi, the circulation runs roughly east to west, increasing in strength as it moves south. The geostrophic current strength decreases with depth by about half every few hundred meters. Below 1000 m (3300 feet), the average current strength is below 5 cm/s (0.1 knot), though patterns at this depth are not entirely known (Flament et al. 1996).

The North Equatorial Current (NEC) runs on the surface reaching an average westward speed of 6.7 in/s (17 cm/s) (0.35 knots) at 13° N, gradually decreasing in speed as it moves north towards the islands. The islands strongly affect the movement of ocean currents between 18° N and 22° N. At the island of Hawaiʻi, the NEC forks, creating the North Hawaiian Ridge Current (NHRC) with its northern branch. Near the islands, the NHRC on average has a width of 62 miles (100 km) and speed of 10 in/s (25 cm/s) (0.5 knots). West of the islands, a clockwise circulation centered at 19° N merges with the southern fork of the NEC and a counterclockwise circulation is centered around 20° 30' N. Between the two circulations lies the Hawaiian Lee Counter Current (HLCC) which ranges from 170° W to 158° W (Flament et al. 1996; Ocean Atlas).

## 6.5. Ocean Chemistry

Three major water masses surround the Hawaiian Islands: the North Pacific Central (NPC), the North Pacific Intermediate, and the Pacific Deep Water. Out of these three water masses, the NPC is found within the sanctuary. The NPC forms shallow water masses ranging in depth from 330 to 980 feet (100 to 300 m) and is characterized by temperatures between 50 °F (10 °C) and 64 °F (18 °C) and salinities between 34.2 ppt and 35.2 ppt (EPA 1980). The water in the NPC mass has the highest salinity of the three masses, but higher temperatures counteract the high salt content, making its relative density the lowest (1997 EIS).

Surface salinities near the Hawaiian Islands range from 35.2 ppt at 26 °N to 34.3 ppt at 10 °N (Flament et al. 1996). Salinity reflects the balance between precipitation and evaporation so the decrease in salinity at the southern end of the Hawaiian Islands reflects the higher amount of precipitation near the Inter-Tropical Convergence Zone. Salinity tends to decrease with depth, indicating the sinking of lower salinity water from the Northern Ocean. Higher salinity water (35.2 ppt) is present at the surface down to 500 feet (150 m), lower salinity (34.1 ppt) down to 1,670 feet (500 m), and then the salinity increases slightly to 34.7 ppt for very deep abyssal waters (Flament et al. 1996).

General approximations of the water chemistry based on measurements taken at a nearshore site off O‘ahu (Chave and Miller 1977), suggest that dissolved oxygen is high, perhaps supersaturated in the surface waters, ranging from 5.4 mL/L at the surface to 5.7 mL/L at 100 m. At 980 feet (300 m) depth off O‘ahu, these values decreased to 5.0 mL/L. A similar distribution pattern for pH was noted off O‘ahu, in December, 1976, where values in the surface waters averaged 8.1 and increased to 8.2 between 82 feet and 154 feet (25 m and 50 m) depths. A decrease to 7.9 was noted at 980 feet (300 m). Environmental Protection Agency (2012) reported that dissolved oxygen conditions in Hawai‘i’s coastal waters are rated good with only 6% of the area rated “fair”. The sites rated “fair” were Pearl Harbor and Kāne‘ohe Bay, with dissolved oxygen just below 5mg/L at Kāne‘ohe Bay.

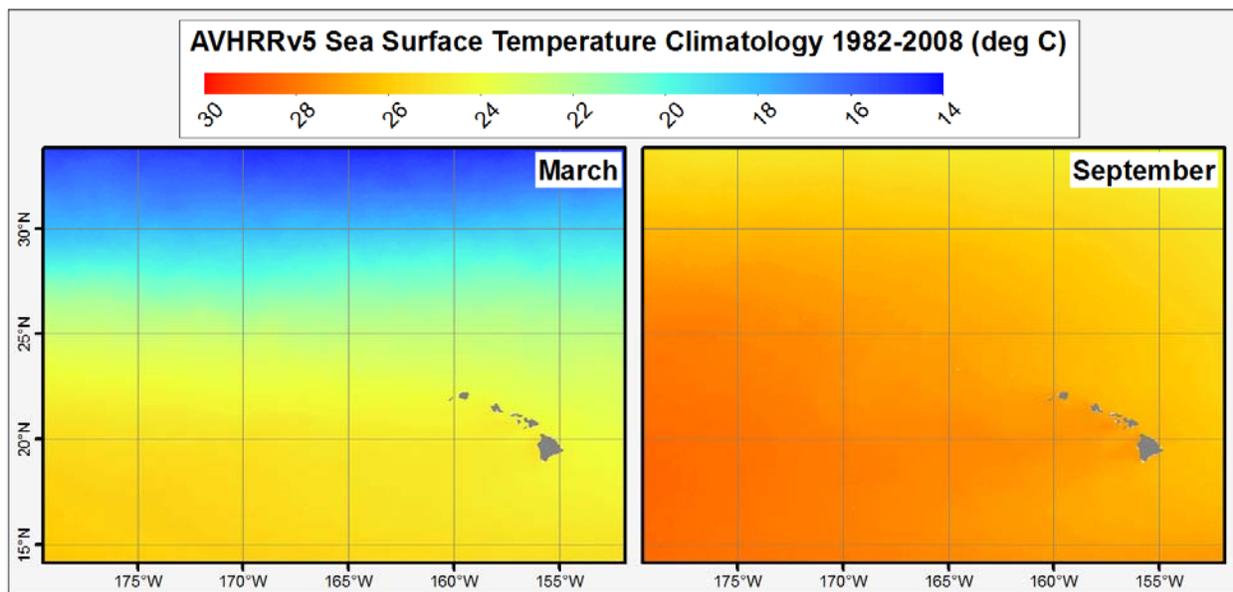
## 6.6. Meteorology and Climatology

The outstanding features of Hawai‘i’s climate include mild temperatures throughout the year, moderate humidity, persistence of northeasterly trade winds, significant differences in rainfall within short distances, and infrequent severe storms. For most of Hawai‘i, there are only two seasons: "summer," between May and October, and "winter," between October and April (NWS 2013).

Average wind speeds in Hawai‘i are highest during the summer when persistent trade winds blow in from the northeast at speeds of 10-25 mph. Trade winds are less prevalent in winter: wind speed exceeds 12 mph only 40% of the time. Major storms mostly occur in the winter and may yield very high winds from any direction.

A mixed water layer is present below the surface and ranges in depth from 400 feet (120 m) in winter to less than 100 feet (30 m) in summer. Below this layer there is a thermocline (sharp decrease in temperature) from 77 °F (25 °C) at the surface to 41 °F (5 °C) at 2,300 feet (700 m), then decreases to 35 °F (1.5 °C) at the bottom. Water temperatures near the Hawaiian Islands are several degrees lower than in the tropical Western Pacific, leading to a decrease in diversity of

aquatic species (Juvik and Juvik 1998). Surface water temperatures have a strong north to south gradient, and a small annual cycle, being lowest around March 15, and highest around September 15. The average surface water temperature around O‘ahu is 75 °F (24 °C) in winter and 81 °F (27 °C) in summer. The variations of temperature tend to parallel the island chain, i.e. surface waters are in general warmer to the west at a given latitude (Figure 12; Flament et al. 1996).



**Figure 12. Average sea surface temperature near the Hawaiian Islands.**

Source: *Hawaiian Islands Humpback Whale National Marine Sanctuary 2013*.

Winds blow many miles across the Pacific Ocean before reaching the Hawaiian Islands. Rainfall occurs when warm, moisture-laden trade wind air is forced up and over mountain peaks causing condensation of atmospheric moisture. The northeastern sides of the islands (the direction of the prevailing winds) are usually the wettest. As the winds descend the leeward slopes, they become warm and dry, thus making the leeward coasts some of the driest in the State.

The Hawaiian Islands have one of the most diverse rainfall patterns on Earth (Giambelluca et al. 2013). Based on data from 1,000 stations from 1978-2007, annual mean rainfall over the State varies from 8 in (204 mm) near the summit of Mauna Kea to 404 in (10,271 mm) near Big Bog on the windward slope of Haleakalā, Maui (Giambelluca et al. 2013). Precipitation is highly variable and is heavily influenced by local topography and the sheltering effects of adjacent islands.