Research & Monitoring
The methodology for assessing impacts to research and monitoring relates specifically to how the sanctuary could provide for future research activities. The methodology used to determine how an alternative would impact research and monitoring activities includes the following: (1) assessing the types of potential research activities that can occur; and (2) assessing the ongoing activities within and around the proposed sanctuary units that may interfere with various research activities.

Human Health & Safety
The impact analysis evaluates the degree to which people within proposed sanctuary waters are protected from dangerous activities and hazardous materials. Where relevant, analysis of human health and safety is included in other human uses (e.g. fishing activity; recreation and tourism). The methodology used to determine how an alternative would impact human health and safety includes the following: (1) evaluating existing activities in the sanctuary to identify their potential to use or generate hazardous material or waste; and (2) assess compliance levels of these activities with applicable federal or location-specific hazardous and non-hazardous waste regulations, guidelines, management plans, spill response and contingency plans, and pollution prevention plans.

9.1.2. Significance of Impacts

To determine whether an impact is significant, Council on Environmental Quality (CEQ) regulations require the consideration of context and intensity of potential impacts (40 C.F.R. § 1508.27). Context normally refers to the setting, whether local or regional, and intensity refers to the severity of the impact. Also CEQ regulations require a discussion of the possible conflicts between the proposed sanctuary alternatives and the objectives of federal, regional, state, and local land use plans and policies for the area concerned (40 C.F.R. § 1502.16(c)).

Impacts are defined in the following categories:
- Significant beneficial impact;
- Less than significant beneficial impact;
- No impact;
- Less than significant adverse impact;
- Significant adverse impact.

9.2. Alternative 1: No Action

The no action alternative would not result in any additional adverse impact on the physical, biological, or human environment within the existing sanctuary. However, taking no action would forgo the beneficial effects associated with the other alternatives (discussed below). Taking no action would result in no change of the current management of the sanctuary under the 2002 Management Plan/Environmental Assessment. Additionally, no new regulations would be proposed for the sanctuary and the boundaries would remain the same. To the extent that future decisions would be made under the existing single-species management of humpback whales, these decisions would either be conducted and reviewed for the NEPA compliance under this EIS, or would be reviewed under a separate NEPA analysis before a decision is made. The no action alternative does not fulfill the purpose and need described in this document (see Section

4). Changes in management, threats, and public involvement in marine resources provide strong rationale to increase the scope of sanctuary management.

9.2.1. Impacts to Biophysical Environment

Habitats

By not taking any action, habitats in the sanctuary, particularly sensitive coral reefs, could be impacted by human use activities that come into direct contact with the seabed including anchoring, research activities (i.e. sampling), and prop scarring. The no action alternative also does not provide for any functional sanctuary discharge regulation. For instance, the discharge of fishing gear, referred to as ghost gear, may become entangled and cause damage to sensitive habitats. Discharge may be land-based or marine-based and although there are other state and federal regulations in place, a sanctuary regulation would provide a higher fee schedule than those of existing authorities for damage, which could be a deterrent to intentional or negligent discharge and the potential for damage to sanctuary habitats.

Marine Species

The no action alternative would allow for the protection of humpback whales regardless of whether they are delisted or not. However, that level of sanctuary protection would not be extended to other species such as other marine mammals, sea turtles, seabirds or protected species. All marine mammals, sea turtles and seabirds, regardless of their status would be ensured protection under the new proposed sanctuary regulations. If any of these animals are not listed as threatened or endangered, under status quo there would be no protection measure in place in the sanctuary. If any proposed new offshore development activities were to either disturb sensitive bottom habit such as coral reefs, including mesophotic corals, then no protection would be afforded to habitats or water quality. Therefore, taking no action would forgo the beneficial effects on marine species within the sanctuary.

Water Quality

A no action alternative would fail to implement a regulation to prohibit discharges. Therefore, both land and marine-based sources of impacts on water quality and sensitive sanctuary ecosystems would not be addressed and would potentially continue to decline. Currently the trend indicates that water and sediment quality are showing clear indications of decline, therefore this alternative would result in a less than significant adverse impact on water quality. If any offshore development

activities were to discharge into the water column, particularly during installation, then no protection would be afforded to water quality.

9.2.2. Impacts to Human Environment

Maritime Heritage Resources

The no action alternative would forego the benefit of the prohibition against the disturbance of maritime heritage resources. Human impacts to maritime archaeological resources can be inadvertent or intentional. Inadvertent impacts include anchor and mooring damage and improper diving activities. Historic sites within the sanctuary show evidence of both. Popular dive sites without proper established moorings are subject to anchor damage. Divers who attempt to clean wrecks by removing the encrusted algae and sediment, unintentionally initiate renewed corrosion. Possible inadvertent impacts include high sedimentation rates (possibly resulting from coastal development), which obscure coastal resources such as fishponds, and sand dredging for channel or beach replenishment projects, which (without proper archaeological surveys) can destroy resource sites. Intentional human impacts include the damage and removal of historic artifacts from shipwreck and aircraft sites. In spite of existing state and federal laws, there have been a number of known incidents within the sanctuary. For example, naval aircraft have been damaged by non-permitted commercial boat moorings attached to propeller shafts, cockpit instruments have been removed, 50-caliber machine guns have been illegally recovered, and compass housings have been taken from historic World War II landing craft. On steamship wreck sites, compasses have been removed, deck lights have been stolen, and brass and copper and bronze fittings have been looted. Based on the status quo, these maritime heritage resources are subject to theft, removal and/or damaging of parts, and both intentional and unintentional damage due to human use activities such as anchoring.

Cultural Resources

The no action alternative would forego the benefit of the prohibition against the disturbance of cultural resources. Cultural resources within the sanctuary face threats from natural and anthropogenic activities. In the marine environment, sediment erosion can damage built structures. Coastal vegetation growth can also damage near-shore structures (*e.g.* fishponds). Various ocean uses also pose a threat to cultural resources. Coastal and offshore development, including utilities that alter submerged lands can potentially impact cultural resources. Detonation of explosives, military training exercises, and waste discharge can harm cultural sites in and adjacent to the marine environment. Based on the status quo, cultural resources are vulnerable to natural erosion, sedimentation, development and explosives, among other things.

Fishing Activities

The no action alternative provides no additional biological or economic impacts, or burden, to the fishing industry or fisheries resources.

Offshore Development

The no action alternative would not impact any proposed offshore development activities because these proposed development activities have already taken the current sanctuary management regime into account.

Education

Under the no action alternative there would be no change to existing sanctuary education programs. Current education and outreach programs focus on humpback whales as well as other marine resources. However sanctuary education programs do not cover the full range of possible activities including specific lessons about ecosystem management, water quality, or climate change, for example. Therefore, the no action alternative would not provide the benefit that an ecosystem approach offers, including a larger context of the place that encompasses both the natural and human community.

Research & Monitoring

The no action alternative would allow for the continuation of research and monitoring focusing solely on humpback whales. With this single species approach, there is no improved understanding of or monitoring for change in the broader environment in which humpback whales spend part of each year of their life cycle, including the important habitats for breeding and birthing, as well as that of the other species that share that same ecosystem. Therefore, the no action alternative would not provide the benefit of ecosystem-wide research and monitoring.

9.3. Alternative 2

9.3.1. Revised Management Plan

The revised management plan proposed under Alternative 2 has been rewritten to reflect ecosystem-based management of marine resources within the sanctuary. This analysis addresses impacts as they relate to the management plan revision presented in this document. While the review of the management plan is required by the National Marine Sanctuaries Act (NMSA), and is considered a federal action requiring at least a consideration of a NEPA analysis, it is important to note the proposed management plan itself does not specifically enable any of the activities listed in the action plans to occur. Non-regulatory management activities could take place in the sanctuary without this revision as described under the no action alternative, and management activities could continue to occur under the current management plan. However, a revised management plan allows for the update of existing non-regulatory programs, calls for new programs to be developed, and includes a process to consider future regulatory actions. Management concerns and resource threats described in the Affected Environment (Section 6) would be improved through the implementation of the non-regulatory activities described in the management plan.

Taken together, the sanctuary expects that the strategies and activities included in this management plan would have less than significant beneficial environmental impact. By increasing protection of resources both directly and through interagency cooperation in research, education, and management, and sanctuary will expand the scope of management from single species to an ecosystem-based management approach. The potential environmental consequences of the proposed activities considered in the revised management plan action plans are described in more detail below. Despite these likely positive effects, detailed analyses of these plans are not possible. Most of the action plans provide general guidelines but are not highly specific or detailed in nature. This combined with the fact that these action plans could be implemented regardless of which alternative is selected, limits the ability to differentiate impacts to the natural or human environment among these alternatives.

Implementing Ecosystem Protection

The *Implementing Ecosystem Protection* thematic area includes three action plans: *Understanding and Managing Species and Habitats*, *Resilience to a Changing Climate*, and *Water Quality Protection*. Together these action plans describe how sanctuary management would adopt an ecosystem-based management approach to protect species and habitats within the sanctuary.

The *Understanding and Managing Species and Habitats Action Plan* describes activities to create a resilient marine ecosystem that can respond to and recover from change, that supports sustainable ecosystem functions and services, and protects healthy populations of biologically, culturally, and economically significant marine species and habitats. Activities to assess, evaluate and develop management approaches to protect and enhance key habitats would contribute to more resilient ecosystems within the sanctuary and could have a positive impact on marine resources. Once priority habitats have been identified, targeted research and monitoring programs can be developed to better understand and address impacts to key habitats in the

sanctuary. Developing collaborative resource management partnerships to better identify, understand and address threats to priority habitats within the sanctuary would enhance understanding of human use activities and their impacts and prioritize future management actions. Increased engagement by the public in identifying and reducing threats could expand ocean stewardship.

Similar efforts to assess human use impacts to protect priority marine species could result in increased understanding of human interactions and threats to species, and could inform appropriate managementapproaches.. Increased understanding of humpback whales could contribute to more effective management actions to protect humpback whales and their habitat. Identifying threats and damage from commercial and recreational ocean users to priority marine species could help identify best management practices to reduce harmful interactions. For example, a management framework to address threats to priority marine species from vessel activity could reduce harmfulinteractions between vessels and species. Conducting and enhancing education and outreach on marine habitats and species could increase public awareness resulting in opportunities for individuals to take responsibility for reducing threats to habitats and species.

The *Resilience to a Changing Climate Action Plan* describes activities to achieve a climate resilient sanctuary maintained through innovative management approaches and supported by an informed public. Activities to identify and better understand existing and potential climate impacts to marine resources, and dependent human communities, would inform targeted sanctuary management actions. This could improve the response capacity of marine resources and human communities in and adjacent to the sanctuary, potentially resulting in a positive impact to marine species. These actions could also improve the ability to inform and prioritize management actions based on natural and cultural resource vulnerability and impacts of climate and non-climate stressors. By tailoring sanctuary management actions to build resilient natural and human systems that have the capacity to respond, recover, or adapt to change, the sanctuary would be able to better manage for change in the future. The creation of a collaborative, coordinated, and integrated climate change approach across agencies would result in a more effective response to climate change impacts to marine resources and communities. Furthermore, integration of climate information into sanctuary outreach would have a positive impact on education by creating a public aware of climate impacts and actions they can take to decrease their carbon footprint and enhance adaptive capacity.

The *Water Quality Protection Action Plan* proposes activities to achieve water quality standards and levels of compliance that support healthy ecosystems, habitats and marine resources. By increasing collaborative partnerships to address land-based and marine-based pollution, the sanctuary would strive to protect and enhance water quality that contributes to sustaining a healthy and fully functioning coral reef ecosystem in the sanctuary. Positive impacts would include increased coordination, more effective water quality management, and higher levels of compliance with State of Hawai‘i water quality standards. The development of water quality research and monitoring partnerships to identify priority areas for improved water quality management by the sanctuary, could increase understanding of research and management needs and gaps which could eventually have a positive impact on water quality resources in the

sanctuary. Specific activities could also have a positive impact on cultural resources by increasing understanding and ability to respond to impacts to water quality in fishponds.

Expanding sanctuary education and outreach to build better awareness about, and engagement in, collectively addressing and contributing to high water quality standards in the sanctuary, could influence behavior resulting in responsible water quality practices. For example, vessel operators who become more knowledgeable about implementing best management practices could be motivated to change their behaviors (such as using pump out stations) which could reduce impacts on water quality. Finally, actions to improve water quality in the sanctuary by reducing wastewater discharge from vessels in the southern Maui Nui area, could result in a better-informed framework for addressing water quality impacts. This could improve understanding of water quality trends in south Maui Nui as well as improve understand of the threats to water quality and how the sanctuary could be involved in addressing water quality threats in south Maui Nui. This could have a positive impact on water quality resources in the long term.

Perpetuating Cultural Heritage

The *Perpetuating Cultural Heritage* thematic area includes two action plans: *Living and Evolving Cultural Traditions* and *Maritime Heritage*. Together these plans describe the activities that the sanctuary staff would undertake to integrate cultural and maritime heritage resource conservation into sanctuary planning efforts.

Through implementation of the *Living and Evolving Cultural Traditions Action Plan,* sanctuary staff would perpetuate customary environmental practices and principles within the sanctuary. As sanctuary staff undertake activities to better understand traditional Hawaiian cultural perspectives as related to the natural environment and customary environmental management practices, they would strengthen place-based knowledge and traditional resource management approaches.

Activities to incorporate traditional Hawaiian management practices into sanctuary resource management approaches could have a positive impact on managing cultural and historic resources within the sanctuary. The human environment would benefit from more culturally appropriate resource management techniques. Within this objective, cultural and historic resources would benefit from an effort to increase understanding of navigational seascapes as an important part of Native Hawaiian heritage.

Efforts to facilitate the communication of cultural perspectives would have a positive impact on resource conservation by enhancing understanding of cultural management of natural resources. In particular, the sanctuary hopes to inform management by coordinating with partner agencies to comprehensively integrate place-based cultural perspectives and practices into resource management. Additionally, sanctuary staff plan to improve management by informing treatment of sensitive cultural information by the sanctuary and other management agencies.

The *Maritime Heritage Action Plan* describes activities the sanctuary would undertake to engage NOAA, the State of Hawai'i, partner agencies, businesses and local communities in the identification and appreciation of maritime heritage resources in Hawai‘i. Collectively these activities would have a positive impact on the preservation of maritime heritage resources for the

benefit of current and future generations. Actions to characterize, understand and assess maritime heritage resources found in sanctuary waters would increase recognition of, and appreciation for, historic places within the sanctuary to inform potential management actions. Increased maritime heritage educational opportunities could increase student awareness and appreciation for the significance of maritime heritage resources within and adjacent to sanctuary waters. Actions could also benefit the ocean-based businesses and tour operators through increased engagement with the dive industry. Outreach activities could also increase appreciation for the maritime heritage of the Hawaiian Islands through sanctuary outreach efforts. Finally, actions to preserve and protect for future generations the maritime heritage resources found within sanctuary waters, could result in more effective and efficient preservation and protection of maritime heritage resources.

Transitioning Towards Sustainability

The *Transitioning Towards Sustainability* thematic area includes three action plans: *Community Partnerships*, *Ocean Literacy*, and *Sustainable Use*. Collectively, these plans describe the activities that sanctuary staff would undertake to engage communities and stakeholders to have a positive impact on marine resources within the sanctuary. The *Community Partnerships Action Plan* describes how the sanctuary would empower human communities to be stewards of their marine environment to enhance management. By working collaboratively with communities on implementing both traditional and science-based management approaches, the sanctuary would have a positive impact on the human environment as well as the biological environment by increasing capacity for effective community engagement in management of marine and cultural resources within the sanctuary.

As the sanctuary continues to increase active participation by enhancing and expanding the sanctuary's volunteer program, the sanctuary would have a positive impact on the human community by expanding the current volunteer base to support effective sanctuary management. These efforts would also have a positive impact on the marine environment by providing opportunities to fill sanctuary management gaps by engaging volunteers in protecting marine and cultural resources within and around the sanctuary. As the sanctuary continues to facilitate dialogue with communities and stakeholders through the community-based sanctuary advisory council (Objective 3), the sanctuary could have a positive impact on the biological environment by improved management by informed decision-makers, scientists and stakeholders to address current and emerging sanctuary issues.

The *Ocean Literacy Action Plan* describes how the sanctuary would increase awareness, knowledge and appreciation of natural and cultural marine resources in order to promote and enhance ocean stewardship within the sanctuary. By targeting audiences with specific messages to enhance their understanding of ecosystem-based management, the sanctuary would be able to reach new and broader audiences with timely and relevant information to strengthen their relationship and awareness of the sanctuary. This could have a positive impact on the human environment by improving education and communication and it could have a positive impact on marine species by improving awareness of resources and the importance of resource conservation. By creating meaningful and relevant learning and engagement opportunities, the sanctuary would have a positive impact on ocean users by increasing their understanding of their relationship to the coastal and marine environment and their role in marine conservation. The

sanctuary could also have a positive impact on marine species by broadening community engagement in sanctuary monitoring programs to increase understanding about sanctuary resources.

The *Sustainable Use Action Plan* would support vibrant coastal communities and economies that promote the sustainable use of the marine environment by engaging ocean-based businesses and tour operators to educate ocean users about sustainable use of natural and cultural resources. This would have a positive impact on ocean-based businesses and tour operators actively implementing best management practices. These activities would also have a positive impact on the marine environment by increased awareness of the significance of resources within sanctuary waters. Outreach to the travel and tourism industry and visitors would result in a better understanding of resources and promote behavioral change by visitors and tourism-based businesses, which would have a positive impact on both the human environment and the biological environment.

Sanctuary Focus Areas

The *Sanctuary Focus Area* thematic area includes four action plans: *Niʻihau, Pīlaʻa, Southern Maui Nui*, and *Maunalua Bay*. Collectively these action plans describe place-based planning efforts to address threats to marine resources at specific locations throughout the sanctuary.

The *Niʻihau Action Plan* describes actions to achieve healthy coastal and marine ecosystems, and preserve the rich cultural history of Niʻihau. Research to identify, evaluate and better understand the marine resources of Niʻihau and Lehua would inform the need to improve resource management for priority areas. Developing a co-management relationship with the Niihauan community would help set standards for safeguarding sensitive information and increase protection for habitats and species through the collaborative management actions the community and sanctuary undertake.

The *Pīlaʻa Action Plan* seeks to establish a replicable model for applying both traditional Hawaiian and western science-based management practices to restore the health of nearshore ecosystems in the Pīlaʻa ahupuaʻa. Gathering scientific and cultural information to assist in planning and implementing the restoration for the Pīlaʻa pilot project would help in the establishment of target conditions for restoration of Pīlaʻa. Developing a restoration and learning site planning process framework specifically for Pīlaʻa would establish a model for application in other ahupuaʻa.

The *Southern Maui Nui Action Plan* seeks to establish a research area in the south Maui Nui area. Activties that seek to reduce wastewater discharge from vessels in south Maui Nui could potentially improve water quality in the area. Improved awareness of alternatives to discharging wastewater and increased use of pump-out stations may also have beneficial impacts to water quality.

The *Maunalua Bay Action Plan* seeks to restore healthy coral reef and sea grass habitats, abundant coral reef marine life and high water quality standards in Maunalua Bay. Restoration activities could have a positive impact on marine resources and habitats including coral reefs and seagrass. Efforts to minimize ocean use impacts could result in more effective management of

sanctuary resources achieved through greater compliance. The use education and outreach as a management tool to engage communities and stakeholders in understanding the value of Maunalua Bay would result in greater community engagement in marine conservation in Maunalua Bay and enhance effectiveness of sanctuary management.

Ensuring Management Effectiveness

The *Ensuring Management Effectiveness* thematic area includes four action plans: *Operational Foundation*, *Compliance and Enforcement*, *Emergency Preparedness and Damage Assessment*, and *Assessing Progress*. Collectively these action plans outline the means and level of institutional support necessary for sanctuary staff to successfully meet the sanctuary goals and activities detailed in each action plan. The *Operational Foundation Action Plan* describes how the sanctuary seeks to attain effective and well-planned operations, human resources and adequate physical infrastructure to support effective management of the sanctuary. Providing administrative and budgetary support would enhance office operations to ensure effective management of the sanctuary.

By attracting, supporting and retaining highly skilled staff to implement the activities of the management plan, the office would have sufficient and appropriate human resource capacity for effective management plan implementation. Proposed activities to assess, evaluate and maintain facilities and vehicles would result in meeting sanctuary standards and supporting staff needs to successfully implement programmatic activities. The proposed outcomes would also include updating planning framework for facility needs and identifying opportunities for new facilities to support sanctuary operations and outreach. Finally, by maintaining an on-water presence in the sanctuary, the sanctuary would ensure a streamlined process for effective and efficient sanctuary research, monitoring, resource protection and education activities, which would facilitate implementation of programs that could have a significant positive impact on these resources.

The *Compliance and Enforcement Action Plan* describes activities that would achieve a high level of compliance with regulations, guidelines, and best practices. Collectively these activities would result in increased protection of the marine environment within the sanctuary and benefit biological, cultural, and historic resources. Activities to increase coordination and effectiveness of enforcement efforts could result in high levels of compliance with sanctuary regulations and enhance protection of sanctuary resources. Enforcement officials would benefit from more streamlined information and coordination. Enhancing education and outreach efforts would increase public understanding, support and compliance with sanctuary regulations. Ocean user groups could benefit from an improved understanding of ocean resources and marine species could benefit from enhanced compliance with sanctuary regulations through community and volunteer efforts.

The *Emergency Preparedness and Damage Assessment Action Plan* would increase protection of sanctuary resources from both natural hazards and human-caused incidents or injuries, through coordinated emergency response and damage assessment. Actions to improve coordinated emergency response would increase coordination in emergency response planning and effectiveness in responding to an incident. Activities within this objective would have a positive impact on emergency preparedness by increasing effective use of tools and data to prepare and respond to emergencies. By preparing for potential impacts from natural hazards and human-use

activities to natural and cultural resources within the sanctuary, sanctuary staff would increase understanding of the spatial distribution of resources and potential threats and hazards. This information could be critical to emergency responders about areas of greatest value, sensitivity, and potential exposure to catastrophic events and have an overall positive impact on human communities and the marine environment by informing response activities to target particularly sensitive areas. Additionally, participation in the Natural Resource Damage Assessment (NRDA) process with ONMS and the State of Hawai‘i for incidents that injure sanctuary resources would increase coordination in the assessment of natural resource damage and subsequent restoration efforts. Under the current management approach, the sanctuary is only authorized to conduct a NRDA for incidents that directly impact humpback whales and their habitat. Under the new proposed ecosystem-based management framework, in the event there was damage from a human use activity to a sanctuary resource, sanctuary management would have the authority to conduct NRDA and evaluate the possibility of recovering damages to any natural resource in the sanctuary.

The *Assessing Progress Action Plan* proposes a performance evaluation mechanism to continually gauge the sanctuary's progress in meeting its management goals and objectives. The use of process indicators as a measure of whether management activities are meeting the natural and cultural resource protection objectives could help ensure robust, results-based implementation of the management plan, and that management plan evaluation is transparent and effectively communicated to diverse audiences. The use of impact indicators to measure the progress of the sanctuary towards addressing change within ecological, cultural or social systems could help inform adaptive management (a calculated change in management to specific levels of change). A framework to support adaptive management actions could have a positive impact on biophysical and cultural resources in the long-term.

9.3.2. Regulations

9.3.2.1. Name Change

Changing the name of the sanctuary would not have any impact on resources.

9.3.2.2. New and Revised Sanctuary-Wide Regulations

Action: Combine humpback whale take and possess regulations

Combining the regulations prohibiting the take and possess of humpback whales would have no impact on resources because the change is administrative and would not affect the way that the sanctuary would regulate, permit, or authorize take and possession of humpback whales.

Action: Clarify humpback whale approach regulation

The clarification and articulation of existing regulations prohibiting approaching humpback whales would have no impact on resources.

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

The proposed regulation to prohibit discharge and altering submerged lands of the Special Sanctuary Management Aras is discussed in Section 9.3.3.3. This section describes the proposal to remove the current regulation at 15 C.F.R. § 922.184(a)(5) that is tied to existing management authorities over these activities (discharge and altering submerged lands) and violations of user groups in regards to these other authorities' permit requirements or permit conditions.

Currently the sanctuary supports the authority of existing agencies that regulate discharge and altering submerged lands by supplementing enforcement efforts and thereby strengthening compliance with the terms and conditions of required leases, permits or licenses issued by federal or state authorities. Most alteration of submerged land activities are overseen by the Army Corps of Engineers (Rivers and Harbors Act (RHA)), Section 404 Clean Water Act (CWA)) and DLNR. The sanctuary supplements the authority of existing agencies (Environmental Protection Agency (EPA), COE, DOH, and DLNR) that regulate the alteration of seabed activities such as dredge, drill, fill and construction. The current sanctuary regulation does not prohibit or restrict those alterations of submerged land activities which do not require federal or state authorization. Regulated by the Corps under Section 10 of the RHA (dredging), by EPA and the Corps under section 404 (discharge of dredge or fill materials) of the CWA, and by Section 103 (ocean disposal of dredge materials) of Title I of the Marine Protection, Research and Sanctuaries Act (MPRSA). Permits are also required by several state agencies for activities in state waters. The sanctuary does not currently have independent authority to restrict or deny discharge or alteration of seabed activities that are specifically allowed under CWA Section 404, RHA Section 10, State of Hawai‘i Conservation District Use Application permits, or other permits issued by other federal or state agencies.

Since these current sanctuary regulations are tied to other agencies' permitable activities only, they cannot be enforced as stand-alone regulations under sanctuary authority. Alternatives 2-3 propose additional regulations that de-couple the discharge and altering submerged lands from other agencies' permit requirements, for discrete areas within the sanctuary (i.e., Special Sanctuary Management Areas). To avoid inconsistency between different areas within the sanctuary, Alternative 2 proposed to remove the current discharge and altering submerged land regulations altogether outside of the Special Sanctuary Management Areas. The net effect is that there will only be discharge and altering submerged lands regulations within the Special Sanctuary Management Areas, and not across the entire sanctuary.

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

A regulation prohibiting removing, damaging, or tampering with any historical or cultural resource within the sanctuary, would directly benefit cultural and maritime heritage resources. ONMS brings maritime heritage capacity to Hawai‘i that no other resource regulatory agency is currently providing. Sanctuary staff are compiling an inventory of maritime heritage resources, doing in-reach and outreach for maritime heritage awareness, and providing training classes in maritime archaeology. Local sanctuary staff are also supported by the Maritime Heritage Program (national system). The NMSA provides a strong legislative authority to protect significant maritime heritage resources. There are several reported instances of damage to maritime heritage resources that could be avoided or prosecuted effectively. For example, sport

divers located a PB4Y-1 navy aircraft ditched near Māʻalaea Bay in 1944, and illegally removed the aft turret 50-cal machine guns without prosecution. Damage was observed to the turret canopy in 2005. Further damage and one of the machine guns missing was reported in 2006. The regulation would also have a significant positive impact on cultural heritage resources, including fishponds and other cultural heritage resources located within the sanctuary. ONMS has a track record of working closely with NGOs and Native Hawaiian consultants on cultural resource issues. The regulation would have the indirect benefit of enhancing cultural knowledge, traditional ecological knowledge, and local communities.

The regulation would complement activities proposed in the sanctuary draft management plan. The *Maritime Heritage Action Plan* outlines several activities to support the no removing, damaging or tampering with any historical or cultural resource regulation, with specific application in Maunalua Bay. The sanctuary would facilitate maritime heritage resource protection inter-agency workshops to enhance awareness about the value and legal status of maritime heritage resources. To support enforcement, the sanctuary would facilitate a local maritime heritage enforcement training program for law enforcement personnel. The *Living and Evolving Cultural Traditions Action Plan* outlines activities the sanctuary would take to identify and protect cultural resources within the sanctuary. Sanctuary staff would coordinate with partners to assess and protect coastal cultural resources such as Native Hawaiian traditional gathering sites and estuaries.

Action: Add authority to issue sanctuary permits and authorizations

Adding the authority to issue general permits, authorizations and special use permits does not, in and of itself, have any affect on the environment. Each individual permit and authorization application is considered on a case-by-case basis. Each agency decision would comply with all applicable review criteria and requirements set forth in sanctuary regulations, the NMSA, and other statutes and regulations, such as NEPA. Interagency consultations and permits may be required of ONMS or the applicant and would be addressed at the time of application review.

9.3.2.3. Special Sanctuary Management Area Regulations for Penguin Bank and Maui Nui Areas

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

A regulation prohibiting taking and possessing any marine mammal, sea turtle, seabird, ESA-listed species or Hawaiʻi Revised Statutes chapter 195D listed species, within or above sanctuary waters in the Penguin Bank and Maui Nui areas would provide additional protection for the species protected under the regulation in this area. Penguin Bank provides important foraging habitat for Hawaiian monk seals (Brillinger et al 2008). Humpback whales are highly concentrated in the Maui Nui area during the winter months, particularly in coastal regions and shallow banks around Maui, Molokaʻi, Kahoʻolawe, and Lānaʻi (Baker and Herman, 1991; Mobley, Bauer and Herman 1999). Wildlife viewing is a popular tourist activity in the Maui Nui area. Adding additional protection to marine mammals, sea turtles and sea birds would ensure that tour operators can continue to operate responsible wildlife viewing excursions. The regulation is unlikely to have a negative impact on tour operators since regulations prohibiting take and possession already exist under other state and federal authorities and most tour operators already comply with voluntary and mandatory wildlife viewing guidelines. Any

education or research projects that require taking or possessing protected species would currently require a permit under the MMPA, ESA, MBTA, or the State of Hawai‘i. The sanctuary would not prohibit any research or monitoring activities that have permits from these authorities so education and research would not be impacted by the proposed regulation.

The proposed regulation would enhance existing management authorities in Penguin Bank and the Maui Nui area. A complete description of regulatory authorities prohibiting take and possess in the marine environment surrounding the populated Hawaiian Islands is in Appendix D.

Action: Add new prohibition on discharges

A regulation prohibiting discharging or depositing any material or matter into sanctuary waters at Penguin Bank and the Maui Nui area (federal waters, outside of 3 nautical miles), or adjacent to these areas if that discharge subsequently enters and injures a sanctuary resource within these two areas would have a positive impact on water quality in those areas.

Vessel discharge is released from commercial and recreational vessels that traverse the area. Additionally, coastal discharge may enter and injure sanctuary resources within the Penguin Bank and Maui Nui areas. Therefore, a regulation prohibiting discharge and enter and injure may increase water quality in these areas. Many marine mammals, invertebrates and fish species may benefit as a result of improved water quality. Additionally, mesophotic and precious coral reef habitats may benefit from improved water quality in Penguin Bank and the Maui Nui area. Precious black corals (*Antipathes dichotoma* and *Antipathes grandis*) grow abundantly in these areas and provide habitat for a range of fish species (Boland et al. 2005). Protecting the black coral habitat may therefore have an indirect benefit for protecting associated fish assemblages.

The proposed discharge regulations could have a minor negative impact on tour operators who previously discharged waste into federal waters of the sanctuary. However, pump out stations installed at the Mā‘alaea Harbor Maui could mitigate some of the impact should vessel operators choose to use them. Reduced discharge is likely to improve human health as a result of improved water quality. The regulation would not have any impact on fishing activities because chumming materials or bait used in or resulting from fishing in the sanctuary are not prohibited under the proposed regulation. Additionally, cultural practices would not be impacted by the regulation since any discharge used for ceremonial purposes is also exempt from the regulation.

The proposed regulation would enhance existing management authorities in Penguin Bank and the Maui Nui area. A complete description of regulatory authorities prohibiting discharge in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on disturbance of the submerged lands

A regulation probibiting dredging, drilling into, or otherwise altering in any way submerged lands in Penguin Bank and the Maui Nui area (federal waters, outside of 3 nautical miles) would have a direct benefit on coral reef habitat within the Penguin Bank and the federal waters of the Maui Nui area. There are currently no protections for any non-precious stony corals, including mesophotic corals, in federal waters of Penguin Bank and the Maui Nui area. This regulation could provide protection to mesophotic corals. In addition, Penguin Bank has been identified as an important bottomfish fishery and is currently protected under state law as a Bottomfish

Restricted Fishing Areas (BRFA). Providing additional protection for coral reef habitat would enhance the preservation of the fishery and further support efforts to protect the area. The regulation would also support and enhance efforts to protect corals in the Maui Nui area that have been designated Essential Fish Habitat (EFH). The established bed for precious coral in the ʻAuʻau Channel places an annual quota on the harvest of black coral and a 5-year moratorium on harvesting gold coral through 2018 (NMFS 2013). Sanctuary management would exempt activities operating under a legal permit under NOAA Fisheries, so the proposed regulation would not add any additional restrictions to harvesting black coral.

The proposed regulation would provide additional protection for maritime heritage resources, which reside on the floor of the Penguin Bank and Maui Nui area. The current number of maritime heritage resources, including ships and airplanes, is unknown; however, historic documents indicate at least 195 ships and aircraft have been lost within sanctuary boundaries. Tour operators are unlikely to engage in activities that would interfere with submerged lands so recreation and tourism is unlikely to be impacted by this regulation. Dive tourism could benefit indirectly from healthier coral reefs potentially resulting in greater fish biomass.

As outlined in the State Energy Policy's second directive, connecting the Hawaiian Islands through integrated, modernized grids is critical to meeting the State of Hawaiʻi energy goals. However, the route for any underwater cable has not been officially determined. If the preferred route transects Penguin Bank or federal waters of the Maui Nui portion of the sanctuary, the utility company would have to apply for a permit from the appropriate authorities for the construction, operation and maintenance of a submerged cable. As the installation of a submarine cable would violate the prohibition on disturbance of submerged lands, the applicant would need to apply for a general permit for the installation of a submarine cable. The permit applicant's project would need to comply with all permit review procedures and criteria, including a requirement the cable project be pre-approved by the State of Hawaiʻi. ONMS would consider project-specific environmental effects and compliance responsibilities at the time of permit application review. In addition, ONMS could issue a special use permit for the ongoing operation and maintenance of a submarine cable if the project is determined to be consistent with section 310 of the NMSA.

The proposed regulation would complement and enhance existing management authorities in Penguin Bank and the Maui Nui area. Penguin Bank was established as a Bottomfish Restricted Fishing Area (BRFA) in 1998. The ʻAuʻau Channel black coral bed is designated an "established bed" with a harvest quota of 5,000 kg every two years that applied to federal and state waters. A 5-year moratorium has been placed on the harvest of gold coral throughout the U.S. Western Pacific (through 2018). All precious corals beds in the Maui Nui area are designated Essential Fish Habitat (EFH) and federal consultations are required for activities that may affect precious corals. The precious corals beds in the ʻAuʻau Channel have been identified for their extremely important ecological functions and are further defined by NOAA Fisheries and WesPac as Habitats of Particular Concern (HAPC). A complete description of regulatory authorities prohibiting disturbing submerged lands in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on use of explosives

A regulation prohibiting possessing or using explosives within the sanctuary waters at Penguin Bank and the Maui Nui area (federal waters, outside of 3 nautical miles) would have a positive impact on the biophysical environment. The biophysical environment in Penguin Bank and the Maui Nui area would benefit from a regulation prohibiting explosives. Explosives can directly cause physical harm to marine species and habitats. Any explosive near the seafloor can have a direct negative impact on coral reefs and marine organisms that depend on coral reefs for their habitat. In additional, explosives can indirectly harm marine species through both light and noise disturbances. Prohibiting the use of explosives in Penguin Bank and the Maui Nui area can also help preserve maritime heritage resources, which could be destroyed or damaged from a blast. The total number of maritime heritage resources in this area is unknown in part because of the depth of channels and the limited resources to explore the area. However, it is likely that the Maui Nui area contains some undiscovered vessels and aircrafts, some of which could potentially be war graves.

Offshore developers requiring the use of explosives for the installation, construction, maintenance or operation of any development project would have to apply for a permit with the appropriate authorities, which could then be authorized by sanctuary management if it met the necessary conditions. Necessary steps would need to be taken to assess the potential impact of the project to marine resources within Penguin Bank and the Maui Nui area. This additional step could result in a minor negative impact to offshore development. Fireworks, as a form of explosive, would be prohibited under this regulation. Federal waters of Penguin Bank and the Maui Nui area are located 3 nautical miles offshore so these are not areas of high firework activity. It is unlikely that recreational or commercial fireworks displays would be negatively impacted by a regulation in these areas.

Prohibiting the use of explosives in Penguin Bank and the Maui Nui area would extend current State of Hawai‘i regulations into Federal waters, which prohibit the possession and use of explosives in or around fishing areas in state waters within three nautical miles (Haw. Adm. Rul. § 13-75-5, Haw. Rev. Stat. § 188-23). A complete description of regulatory authorities prohibiting the use of explosives in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on introduction of introduced species

A regulation prohibting introducing or otherwise releasing an introduced species into the sanctuary waters in the Penguin Bank and Maui Nui areas (federal waters outside of 3 nautical miles) could reduce the threat to native species from introduced species in Penguin Bank and the Maui Nui area. The introduction of an alien pest species snowflake coral (*Carijoa riisei)* is a threat to the precious black coral fishery in the Maui Nui area (WPRFMC 2013). Snowflake coral are often found on shipwrecks or in sheltered and shaded crevices or shallow caves on the deeper reefs. They are particularly abundant in the ‘Au‘au Channel because of the high irradiance in shallow water and cold temperatures in deep water (Kahng 2005). They are believed to out-compete black coral for space and other resources (Colin 1995; Thomas 1979). Since black coral is harvested sustainably for commercial jewelry sales, a regulation prohibiting introduced species could indirectly benefit commercial jewelers.

The prohibition on releasing an introduced species into the sanctuary is not expected to significantly adversely impact tour operators because this activity is generally not part of their business or operational practices. Catch and release fishing activities would not be affected because the prohibition would not apply to the catch and release of fish species already present in Penguin Bank and the Maui Nui area. Ocean users may indirectly benefit from the increased health of the marine environment. Preventing their introduction would therefore benefit ocean users by preventing detrimental impacts.

The proposed regulation would compliment and enhance existing management authorities in Penguin Bank and the Maui Nui area. A complete description of regulatory authorities prohibiting introduced species in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

9.3.3. Boundary Change

9.3.3.1. Ni‘ihau

Incorporating the waters around the island of Ni‘ihau into the sanctuary would have a positive impact on biophysical resources. The limited information on larval transport and connectivity between Ni‘ihau with other Hawaiian Islands and submerged reefs compel natural resource managers to consider the important ecological role that Ni‘ihau may have within the whole Hawaiian Archipelago. Ni‘ihau is the closest of the populated Hawaiian Islands to the Northwestern Hawaiian Islands and the Papahānaumokuākea Marine National Monument and is at the interface between the two bioregions and the specific biophysical and cultural connectivity dynamics at this interface are of special interest.

Ni‘ihau has higher fish biomass than other populated Hawaiian islands, yet lower biomass than the Northwestern Hawaiian Islands, serving as a functional transition zone in the archipelago. Ni‘ihau is also an important habitat for bottomfish, monk seals and humpback whales. Commercially valuable bottomfish have been observed in greater size and abundance in the Bottomfish Restricted Fishing Area (BRFA) off Ni‘ihau than outside the BRFA. Monk seals have been surveyed in significantly greater numbers on Ni‘ihau as compared to other populated islands in the archipelago and Lehua Islet is an important monk seal feeding and resting site. Humpback whales have also been observed in high numbers near the coast of Ni‘ihau. These marine species within this boundary extension would benefit from inclusion within the sanctuary as a result of the ecosystem-based management approach proposed in this management plan. The expanded management scope would include more marine resources within the sanctuary for consideration in research, monitoring and protection. The *Understanding and Managing Species and Habitats Action Plan* includes a focus on marine species (e.g., monk seals, marine turtles, and spinner dolphins). The *Ni‘ihau Action Plan* includes activities to assess and protect sensitive species and habitats specifically at Ni‘ihau and Lehua, such as monk seal pupping sites. Humpback whales around Ni‘ihau would benefit from inclusion in the sanctuary due to the sanctuary regulation prohibiting taking and possessing whales.

The habitats around the island have not been well surveyed so little is known about the composition of benthic habitats. The surveys that have been completed show a relatively low percent coral cover, compared to other populated Hawaiian islands, with lower rates of coral disease due to isolation (Friedlander et al. 2008). The majority of the benthic cover surveyed around the island is crustose coralline algae. By being included in the sanctuary, the physical habitat within this boundary addition would benefit from the sanctuary’s shift to ecosystem-

based management. In the *Understanding and Managing Species and Habitats Action Plan*, activities are planned to monitor and protect habitats.

Water quality around Ni‘ihau would benefit from inclusion in the sanctuary through plans to monitor and improve conditions. The *Ni‘ihau Action Plan* includes a specific activity to assess the water quality and land and water based sources of pollution on Ni‘ihau and Lehua. In addition to that site-specific activity, the *Water Quality Protection Action Plan* includes activities that would improve the water conditions throughout the sanctuary. These activities include partnering with other organizations and agencies on monitoring, pollution and debris reduction, and outreach on water quality issues.

On Ni‘ihau, Hawaiian culture remains a strong part of the population’s lifestyle so many natural resources are currently used in cultural practices. Traditional subsistence fishing remains an important activity in Ni‘ihau, so the fish within the reef, which have been reserved for Niihauans exclusively by King Kamehameha since 1839 (Tava 1984, Meyer 1998). *Pupu* shells are also an important cultural resource for the stringing of *lei pupu o Ni‘ihau*. Maritime heritage and cultural resources around Ni‘ihau would benefit from inclusion in the sanctuary through activities in the management plan, such as *Activity SN-1.1*, which proposes to compile information on cultural resources around Ni‘ihau. Niihauans use traditional fishing methods such as nets and fish in particular locations called *koa* (Tava 1984, Meyer 1998). These traditional fishing practices, along with other cultural practices on Ni‘ihau, would benefit from inclusion in the sanctuary as a result of the support lent to cultural perpetuation in several action plans. In the *Ni‘ihau Action Plan*, the sanctuary plans to develop protocol for protecting sensitive cultural knowledge. The *Living and Evolving Cultural Traditions Action Plan* includes activities sanctuary-wide to gather information and incorporate cultural knowledge into management. These activities are not expected to impact the actual practice of cultural traditions within the sanctuary; however increased knowledge of cultural practices is the first step to providing appropriate protection.

The inclusion of Ni‘ihau in the sanctuary will not impact marine traffic in the area because humpback whales approach regulations are already established under the Marine Mammel Protection Act (MMPA). The inclusion of Ni‘ihau would have a beneficial impact on education and outreach in the area. The *Ni‘ihau Action Plan* includes activities to expand educational opportunities both for children on Ni‘ihau and for off-island audiences. More broadly, the *Ocean Literacy Action Plan* outlines sanctuary-wide education activities, such as expanding the Ocean Awareness Training (OAT) program, teacher trainings and student internship opportunities. Only a limited amount of research has been conducted on the island due to highly restricted access. Including Ni‘ihau in the sanctuary and working cooperatively with the landowners would have a beneficial impact on research and monitoring activities in the area. The *Understanding and Managing Species and Habitats Action Plan* includes several activities that would conduct and support research in the sanctuary including citizen science programs, pilot research projects and behavior pattern studies sanctuary-wide that would contribute to the body of research in the region.

9.3.3.2. O‘ahu

Extending the western boundary of the sanctuary on the north shore of O‘ahu to Ali‘i Beach Park would have a positive impact on biophysical resources. The physical habitat of the proposed boundary extension on the north shore of O‘ahu includes intermittent coral cover about 0.6-1.2 miles (1-2 km) offshore (Shallow Water Benthic Habitats of the Main Hawaiian Islands 2007). By being included in the sanctuary, the physical habitat within this boundary addition would benefit from the sanctuary’s shift to ecosystem-based management. In the *Understanding and Managing Species and Habitats Action Plan*, activities are planned to monitor and protect habitats. Similarly, the marine species within this boundary extension would benefit from inclusion in the sanctuary as a result of the ecosystem-based management approach proposed in this management plan. The expanded management scope would include more marine species within the sanctuary for consideration in research, monitoring and protection. In particular, the *Understanding and Managing Species and Habitats Action Plan* includes a focus on protected species. Both green sea turtles (honu) and Hawaiian monk seals have been observed in this area of the north shore of O‘ahu and would therefore benefit from increased protection. Humpback whales within the boundary addition would benefit from inclusion in the sanctuary due to the regulations which currently prohibit taking and possessing humpback whales.

Maritime heritage and cultural resources within this boundary addition would benefit from inclusion within the sanctuary through the activities described within the *Perpetuating Cultural Heritage* thematic area. Activities that would support cultural and historic resources include creating spatial databases of these resources. The inclusion of this section of the north shore of O‘ahu into the sanctuary would have a beneficial impact on education and outreach in the area. In addition to the sanctuary-wide education and outreach activities outlined in the *Ocean Literacy Action Plan*, the sanctuary plans to specifically identify facilities on the north shore of O‘ahu to provide education and outreach opportunities adjacent to the sanctuary.

Tourism and recreation on the north shore of O‘ahu are closely tied to surfing. This management plan proposes to support the cultural significance of surfing in the area. The inclusion of this boundary addition would potentially benefit the region’s recreation and tourism, and the economic revenue therein. Recognizing the State of Hawai‘i surf reserve on the north shore of O‘ahu, the *Living and Evolving Cultural Traditions Action Plan* plans to engage in efforts to perpetuate broad understanding of surfing as a thriving aspect of cultural heritage in Hawai‘i, which could include interpretive signage and outreach and education. This supports EO 10-07 which encourages DLNR to engage organizations and associations to place appropriate signs or markers that are designed to commemorate and identify a Hawaii surfing reserve. The increased promotion of surfing heritage on the north shore of O‘ahu could have a beneficial impact on sustainable tourism in the region. Although Hale‘iwa Harbor is excluded from the proposed sanctuary boundaries, inclusion of waters outside the harbor could impact marine traffic entering

or leaving Haleʻiwa Harbor in the case that whales are present. Vessels that approach within 100 yards of a whale within the proposed boundary would be in violation of the sanctuary humpback whale approach regulations. However this is not an additional burden on vessels since humpback whale approach regulations are already in place under the MMPA.

The inclusion of this boundary addition would have a beneficial impact on cultural practices within the area as a result of the support lent to cultural perpetuation through the *Living and Evolving Cultural Traditions Action Plan*. This action plan includes activities to gather information and incorporate cultural knowledge into management. These activities are not expected to impact the actual practice of cultural traditions within the sanctuary; however increased knowledge of cultural practices is the first step to providing appropriate protection.

Including this boundary addition in the sanctuary would have a beneficial impact on research and monitoring activities in the area. The *Understanding and Managing Species and Habitats Action Plan* includes several activities that would conduct and support research in the sanctuary. Specifically, citizen science programs, pilot research projects and behavior pattern studies sanctuary-wide would contribute to the body of research in the region.

9.3.3.3. Kauaʻi: Hāʻena Ahupuaʻa

Extending the western sanctuary boundary on the north shore of Kauaʻi to the Hāʻena ahupuaʻa would have a positive impact on the biophysical environment. The physical habitat in this boundary extension includes coral reef which extends from Hāʻena State Park to Keʻe Beach about 300 feet offshore that forms a near shore sandy lagoon (Clark 1990). This habitat would benefit from inclusion in the sanctuary as a result of the sanctuary's shift to ecosystem-based management. In the *Understanding and Managing Species and Habitats Action Plan*, activities are planned to monitor and protect habitats. Keʻe Beach was found to have relatively low species richness while the reef flat and lagoon provided habitat for juvenile fish (Stepath 1999). Hawaiian monk seals and humpback whales have been observed in the area (Hawaiian Monk Seal Observations 2012, Mobley 2003). Including this boundary addition in the sanctuary would have a beneficial impact on these marine species, among others, through the sanctuary's expanded management scope, which would include a greater variety of marine species within the sanctuary for consideration in research, monitoring and protection. Humpback whales within the boundary addition would benefit from inclusion in the sanctuary due to sanctuary regulations prohibiting taking and possessing humpback whales. The *Water Quality Protection Action Plan* outlines several activities that would improve water conditions throughout the sanctuary, including the boundary extension to include Hāʻena ahupuaʻa. These activities include partnering with other organizations and agencies on monitoring, pollution and debris reduction, and outreach on water quality issues.

This boundary addition and the adjacent land include several features of cultural significance such as the Maniholo lava tube, Naia fishpond and the lagoon which was traditionally used for hukilau (Hawaiian net fishing; Clark 1990, Fish Ponds 2012). The cultural and historic resources in this boundary addition would benefit from inclusion in the sanctuary through the activities described within the *Perpetuating Cultural Heritage* thematic area. Activities that would support cultural and historic resources include creating spatial databases of these resources. Moving forward, and when appropriate, the sanctuary would explore the feasibility of adjusting other boundaries to conform to these traditional management areas. In some instances, this is

challenging because over time and within different contexts the ahupuaʻa boundaries have changed.

The inclusion of this boundary addition would have no impact on recreational fishing activities in the area. Its inclusion, though, could potentially have a beneficial impact on the community-based subsistence fishing area (CBSFA) established in Haʻena. As described above, the inclusion of this boundary addition would have a beneficial impact on cultural practices within the area as a result of the support lent to cultural perpetuating through the action plan *Living and Evolving Cultural Traditions*. This action plan includes activities to gather information and incorporate cultural knowledge into management. These activities are not expected to impact the actual practice of cultural traditions within the sanctuary; however increased knowledge of cultural practices is the first step to providing appropriate protection.

Vessels that approach within 100 yards of a whale within the proposed boundary extension would be in violation of sanctuary humpback whale approach regulations. However this is not an additional burden on vessels since humpback whale approach regulations are already in place under the MMPA. The inclusion of this boundary addition into the sanctuary would have a beneficial impact on education and outreach in the area. Several of the action plans include education and outreach activities that would improve public awareness and information in the area. In particular, the *Ocean Literacy Action Plan* outlines sanctuary-wide education activities, such as expanding the Ocean Awareness Training program, teacher trainings and student internship opportunities. Including this boundary addition in the sanctuary would have a beneficial impact on research and monitoring activities in the area. The *Understanding and Managing Species and Habitats Action Plan* includes several activities that would conduct and support research in the sanctuary. Specifically, citizen science programs, pilot research projects and behavior pattern studies sanctuary-wide would contribute to the body of research in the region.

9.3.3.4. Kauaʻi: Pīlaʻa Ahupuaʻa

Extending the eastern sanctuary boundary on the north shore of Kauaʻi to include the Kāhili ahupuaʻa, West Waiakalua ahupuaʻa, East Waiakalua ahupuaʻa, and Pīlaʻa ahupuaʻa would have a positive impact on the biophysical environment. The total area of the proposed boundary expansion would be approximately 5.02 square miles (0.4% of the current sanctuary area). The proposed sanctuary area would be used to pilot resource management strategies that incorporate traditional knowledge and scientific practices.

The physical habitat of the bay proposed for inclusion in the sanctuary, which stretches between Kepuhi Point and Mokolea Point, is characterized by a coral reef and nearshore lagoon of turf algae and uncolonized seafloor (Shallow-Water Benthic Habitats of the Main Hawaiian Islands 2007). This habitat would benefit from inclusion in the sanctuary as a result of the sanctuary's shift to ecosystem-based management. In the *Understanding and Managing Species and Habitats Action Plan*, activities are planned to monitor and protect habitats. Hawaiian monk seals, green sea turtles (honu), toothed whales and humpback whales have all been observed in the proposed boundary addition off Pīlaʻa (Hawaiian Monk Seal Observations 2012, Sea Turtle Nesting and Basking Beaches 2012, Mobley 2003). Including this boundary addition in the sanctuary would have a beneficial impact on these marine species, among others, through the sanctuary's expanded management scope, which would consider a variety of marine species in

research, monitoring and protection. Humpback whales within the boundary addition would benefit from inclusion in the sanctuary due to sanctuary regulations prohibiting taking and possessing humpback whales. Water quality in the stream entering Pīlaʻa lagoon and reef was severely degraded as a result of private construction projects on the adjacent land (Pflueger Clean Water Act Settlement 2011). The *Pīlaʻa Action Plan* aims to restore the reef, lagoon and small estuary to healthy water conditions. Therefore, inclusion of this area into the sanctuary would have a beneficial impact on water quality.

Parts of the reef within this boundary addition hold cultural significance as limu kohu harvesting locations. Limu and other cultural and historic resources in this boundary addition would benefit from inclusion in the sanctuary through the activities described within the *Pīlaʻa Action Plan*. In addition to the cultural perpetuation activities described in other action plans, this plan outlines restoration of the lagoon and reef area through traditional and western science approaches. The goal of the plan is to restore the natural and biological environment for traditional subsistence harvest of natural and cultural resources. The Pīlaʻa reef, lagoon, and small estuary holds resources that Hawaiians cultivated, husbanded and valued highly (Andrade 2012). The cultural practices of maintaining and harvesting these resources would benefit from the inclusion of this boundary addition as a result of the support lent to perpetuating culture through the action plan *Living and Evolving Cultural Traditions*. The *Pīlaʻa Action Plan* also supports cultural perpetuation by incorporating traditional knowledge and practices into the restoration of the lagoon system.

Whales have been observed within the proposed boundary addition off Pīlaʻa, so the inclusion of this area could impact marine traffic in the area in the case that whales are present. Vessels that approach within 100 yards of a whale within the proposed boundary extension would be in violation of the sanctuary humpback whale approach regulations. However this is not an additional burden on vessels since humpback whale approach regulations are already in place under the MMPA. The inclusion of this boundary addition into the sanctuary would have a beneficial impact on education and outreach in the area. Several of the action plans include education and outreach activities that would improve public awareness and information. In particular, the *Ocean Literacy Action Plan* outlines sanctuary-wide education activities, such as expanding the Ocean Awareness Training program, teacher trainings and student internship opportunities. Including this boundary addition in the sanctuary would have a beneficial impact on research and monitoring activities in the area. The *Understanding and Managing Species and Habitats Action Plan* includes several activities that would conduct and support research in the sanctuary. Specifically, citizen science programs, pilot research projects and behavior pattern studies sanctuary-wide would contribute to the body of research in the region.

9.3.3.5. Penguin Bank

Incorporating waters on the southern end of Penguin Bank into the sanctuary would have a positive impact on biophysical resources. The proposed regulations for federal waters (outside of 3 nautical miles) would extend to the additional areas and provide additional protection for critical habitats and a range of marine species. Reef building corals (i.e., Scleractinian) are found along the outer ledges along the southern end of Penguin Bank, and mesophotic corals are found along the slopes of the outer ledges to depths of nearly 400 m. The proposed regulation prohibiting altering submerged lands would provide protection for these reef species.

Additionally, the coral reef structure in this area provides critical habitat for several species of bottom fish. Although this area is already protected as a Bottom Fish Restricted Area (BRFA), the additional protections on habitat could contribute to healthy populations of bottom fish. This will have an overall beneficial impact on the area as well as elsewhere in the Hawaiian Islands where it is predicted that larvae produced by fish at Penguin Bank include may flow including Niʻihau, Kauaʻi, Oʻahu, Lanaʻi, Molokaʻi, Maui, Kahoʻolawe and Northern Hawaii Island (Vaz 2012). The proposed regulations prohibiting discharge into the sanctuary would benefit water quality throughout the area which could benefit species and habitat throughout the area as well as in adjacent areas.

Monk seal foraging habitat extends beyond the current sanctuary boundary on the southern end of Penguin Bank so incorporating the additional area will provide additional protection. The proposed regulation prohibiting taking or possessing any marine mammal will apply to monk seals found in the new area.

Biophysical resources will also benefit from the proposed actions in the draft management plan. The *Understanding and Managing Species and Habitats Action Plan* includes a focus on marine species including monk seals. The *Water Quality Protection Action Plan* could contribute to monitoring and improving conditions in the area.

Location	Alternatives	Regulatory Action	Management Plan Action	Impacts
Proposed New Boundary Additions				
Ni'ihau 218.15 mi^2	2 – 4	Sanctuary-wide regulations	Sanctuary Focus Area Action Plan	+ Marine species, including monk seals, whales and coral reefs, would have greater protections + Cultural resources and practices would have greater protections - Marine traffic may face greater penalties for taking whales and other protected species
Hā'ena Ahupua'a, Kaua'i 8.03 mi^2	2 – 4	Sanctuary-wide regulations	Overall Management Plan	+ Marine species, including coral reefs, monk seals and whales would have greater protection + Cultural practices, including subsistence fishing, would be supported - Marine traffic may face greater penalties for taking whales and other protected species
Pila'a Ahupua'a, Kaua'i 5.02 mi^2	2 – 4	Sanctuary-wide regulations	Sanctuary Focus Area Action Plan	+ Marine species, including coral reefs, sea turtles and water quality, would have greater protections + Cultural practices, including harvesting of limu and opihi, would be supported - Marine traffic may face greater penalties for taking whales and other protected species
North Shore, O'ahu 4.00 mi^2	2 – 4	Sanctuary-wide regulations	Overall Management Plan	+ Marine species, including sea turtles and monk seals would have greater protections + Cultural practices, including surfing, would be perpetuated - Marine traffic from harbor may face greater penalties for taking whales and other protected species
Hanalei River, Kaua'i 0.04 mi^2	4	Sanctuary-wide regulations	Overall Management Plan	+ Marine species, including native gobies and water quality, would have increased protections + Cultural resources and practices would have increased protections
Penguin Bank,	2 – 4	Sanctuary-wide or	Overall Management	+ Marine species, including monk seals and corals, would have greater

Location	Alternatives	Regulatory Action	Management Plan Action	Impacts
Moloka‘i		federal waters regulations	Plan	protections ⊙ Offshore development would require a permit - Marine traffic may face greater penalties for taking protected species
Existing Sanctuary Areas with Proposed New Actions				
Mā‘alaea , Maui	2 - 4	Sanctuary-wide regulations	Sanctuary Focus Area Action Plan	+ Marine species, including water quality and nearshore ecosystems, would be improved
Maui Nui, between Lāna‘i, Moloka‘i and Maui	2 – 4	Sanctuary-wide or federal waters regulations	Overall Management Plan	+ Marine species, including mesophotic and precious black corals, would have greater protections ⊙ Offshore development would require a permit - Marine traffic may face greater penalties for taking protected species
Maunalua Bay, O‘ahu	3 & 4	Sanctuary-wide or site-specific regulations	Sanctuary Focus Area Action Plan	+ Marine species, including native coral reef habitats and water quality, would have greater protections + Cultural practices, including traditional navigation techniques would be supported - Marine traffic, including personal water crafts, may face higher penalties for taking protected species

Table 39. Summary of impact of proposed actions to specific locations.

9.4. Alternative 3: Proposed Action/Preferred Alternative

Alternative 3 proposes the same actions as Alternative 2 with the addition of extending the Special Sanctuary Management Area regulations to Maunalua Bay. Therefore the environmental impacts would be the same as those presented in Alternative 2 with only the differences described below.

9.4.1. Regulations

9.4.1.1. Special Sanctuary Management Area Regulations for Maunalua Bay

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

A regulation probitibiting taking or possessing any marine mammal, sea turtle, seabird, ESA-listed species or Hawai‘i Revised Statutes chapter 195D listed species, within or above sanctuary waters in Maunalua Bay (state waters within 3 nautical miles) would benefit marine species in the area. Humpback whales, green sea turtles and Hawaiian monk seals are known to inhabit the waters of Maunalua Bay. The high use of personal watercraft and other watercraft as well as high commercial and recreational diving activity in Maunalua Bay may increase the likelihood that ocean users would come in contact with these protected species. The proposed regulation to prohibit taking and possessing protected species in Maunalua Bay would benefit those species. The sanctuary regulation would provide an additional legal mechanism to enforce take and possession of protected species helps to reduce and dissuade the take of these species through a legal mechanism. Prohibiting the take or possession humpback whales, marine mammals, sea turtles, seabirds, ESA-listed species or Hawai‘i Revised Statutes chapter 195D listed species would allow the sanctuary under the NMSA to apply enforcement mechanisms and pursue civil violations of take and possession of these protected species.

The proposed regulation would enhance existing management authorities in Maunalua Bay. Maunalua Bay is a state designated Ocean Recreation Management Area (ORMA) managed by the Division of Boating and Ocean Recreation (Haw. Adm. Rul. §13-256). ORMAs serve to restrict certain commercial activities to specific locations and time periods, as well as regulate equipment use. Permits are issued for activities within different zones and quotas are placed on the number of boats that can operate within a specific zone. Recreational and commercial vessels may use designated areas when a permitted activity is not taking place and may cross these areas at all times with caution. A complete description of regulatory authorities prohibiting take and possess of protected species in discharge in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on discharge

A regulation prohibiting discharging or depositing any material or matter into sanctuary waters in Maunalua Bay (state waters within 3 nautical miles), or adjacent to this area if that discharge subsequently enters and injures a sanctuary resource would benefit the biophysical environment in the area. The nearshore environment along Maunalua Bay has been impacted by a variety of anthropogenic stressors. The west side of the bay has experienced dramatic shoreline changes and sediment flux (Wolanski et al. 2009). The central part of the bay has experienced a land

based sediment buildup coinciding with establishment of an alien invasive alga *Avrainvillea amadelpha*. The east side of the bay has been heavily developed, and the original shoreline has been extended seaward through fill and the construction of the Hawai‘i Kai private marina. Offshore waters of Maunalua Bay have high human use by boaters, personal watercraft users, kayakers, and canoe paddlers facilitated by a nearby public boat ramp and the private marina. The bay adjoins seven watersheds with at least four perennial streams, and as many as 52 drainages (most of which have been channelized), from watersheds that are largely urban with impervious surfaces. The characteristics of these modified drainages facilitate the rapid movement of storm water, sediments, nutrients and other chemicals directly into the ocean. Community, non-government organizations (NGOs), state and federal government agencies have made efforts for over a decade to improve the health of the bay and restore the ecosystem. The proposed regulation would reduce impacts to the biological and physical environment in Maunalua Bay by improving the resilience of the ecosystem and facilitating recovery of degraded resources.

A regulation prohibiting the discharge of material in Maunalua Bay, or outside of Maunalua Bay where the material enters and injures sanctuary resource, would prevent major sources of stressors such as marine debris, pollutants, sediment, nutrients and pathogens from degrading water quality. While major construction, excavation, dredging and dumping require a permit under state regulations, discharge of treated vessel sewage is allowed. The reduction in discharge material would improve water quality conditions for coral and other benthic species within the bay. This improvement in habitat may result in improvements in health, recovery and resilience of species and habitats in the bay. Species such as sea turtles and marine mammals benefit from healthy and vibrant ecosystems.

Recreation activities are abundant in Maunalua Bay however most tour operators already adhere to discharge regulations under the State of Hawai‘i so the sanctuary regulations are unlikely to have an additional impact on those industries. Prohibiting discharge may provide an indirect benefit to maritime heritage resources that could be damaged or degraded from harmful discharge.

The proposed regulation would enhance existing management authorities in Maunalua Bay. Existing management authorities in Maunalua Bay are described in the previous section. A complete description of regulatory authorities prohibiting discharge in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on disturbance of the submerged lands

A regulation prohibiting dredging, drilling into, or otherwise altering in Maunalua Bay (state waters within 3 nautical miles) would reduce direct physical and biological damage to marine habitats. Coral reef habitats are particularly vulnerable to impacts from disturbing submerged lands. Coral reef organisms grow relatively slowly and are vulnerable to anthropogenic threats such as discharge and climate change (i.e. ocean acidification). Therefore, it is important to reduce other disruptive stressors, such as disturbing the seafloor, which may exacerbate degradation. The frequent use of jet skis and speed-boats in Maunalua Bay increases the likelihood of vessel groundings, which can damage the seafloor, especially in shallow areas. Anchoring vessels on submerged lands is prohibited if it damages live coral but coral is not

always visible from the surface of the water. Newly recruited coral, juveniles and cryptic coral species that remain small are all susceptible to unintentional anchor damage. Most coral grow on hard substrate, which is considered very sensitive to damage, so it is less likely that anchoring on sand would damage coral.

The proposed prohibitions against disturbing the seafloor within Maunalua Bay would allow the sanctuary, under the NMSA, to apply enforcement mechanisms and pursue civil violations for altering the seafloor. Sanctuary management is proposing to have the authority to authorize permits for construction and dredging in Maunalua Bay so the impact to development is not likely to be significant. Koko Marina has been dredged at least nine times since the initial development in 1959 (Anchor QEA, L.P. 2011). Most recently, parts of the marina and entrance channel were dredged in 2012 and the excess material was relocated to areas within the marina and off Portlock and Maunalua Bay beach parks.

There was a large fishpond in Maunalua Bay, called Loko Keahupua-o-Maunalua, which was once the largest fishpond amongst all the Hawaiian Islands. Loko Keahupua-o-Maunalua once supplied mullet, ʻamaʻama, and other fish to populations in the surrounding area. There were also fishing heiau and several other, smaller fishponds along the coast in Maunalua Bay including Wailupe and Kupapa Fishponds, both of which have been filled in and built upon, thus are no longer operational. Most of these cultural resources are no longer recognizable or in operation, with some exceptions such as a fish trap that may still remain intact near the entrance to the marina (Anchor QEA, L.P. 2011). Prohibiting the alteration of submerged lands could, by extension, prohibit the alteration of the cultural resources that remain in the bay such as fishpond walls and traps, which would benefit these resources.

A community-based conservation organization, Mālama Maunalua, promotes native algae in the bay by hosting invasive algae removal volunteer events. If these activities are authorized by the State of Hawaiʻi. Under alternative 3, sanctuary management would have the authority to authorize the permit issued by the State of Hawaiʻi for an activity that violates a sanctuary regulation. The regulation to prohibit disturbing the seafloor would also prevent incidental direct damage to maritime heritage resources. By extension, maritime heritage resources are considered part of the seafloor and the exception for allowed anchoring on sand does not allow anchoring on these resources. For these reasons, the implementation of no disturbance to the seafloor regulations would have a less than significant beneficial impact on maritime heritage resources.

The proposed regulation would enhance existing management authorities in Maunalua Bay. Existing management authorities in Maunalua Bay are described in the previous section. A complete description of regulatory authorities prohibiting altering submerged lands in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on use of explosives

A regulation prohibiting possessing or using explosives Maunalua Bay (state waters within 3 nautical miles) would help reduce direct damage to marine species and habitats. In addition, the prohibition would prevent explosive-related impacts to water quality such as explosive chemicals and sediment generated from explosions. Explosives on coral reefs have been documented to be extremely destructive. Explosions can physically destroy marine life, coral reefs, other benthic

habitats, chemical residues from the explosions can be toxic to marine life and noise can be disruptive to animal behavior. In addition, a variety of contaminants can enter the marine environment through the debris and fallout fireworks produce.

The proposed regulation would enhance existing management authorities in Maunalua Bay. Existing management authorities in Maunalua Bay are described in the previous section. A complete description of regulatory authorities prohibiting explosives in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

Action: Add new prohibition on introduction of introduced species

A regulation prohibiting introducing or otherwise releasing an introduced species into Maunalua Bay (state waters within 3 nautical miles) would have a positive impact on the biophysical environment in the area. Several introduced species have become established in Maunalua Bay including sponges, bryozoans, fish and at least four species of alien invasive algae. Large-scale restoration efforts to remove invasive algae (focusing on *Avrainvillea amadelpha*) and open habitat for native species have been ongoing. Recently one of the top five most invasive alien algal species (*Kappaphycus sp.*) in Hawai‘i (not previously known to Maunalua Bay or the south shore of O‘ahu) was found near the boat ramp shoreline of Maunalua Bay, which prompted alarm of a new potential invasion of Maunalua Bay (Conklin et al. 2009). However, ocean users were able to remove the algae from the shoreline before it had time to establish and subsequent surveys found no other signs of the alga, suggesting that it had come in as fresh material from drift or watercraft. Introduced species that compete with native species for resources and space, can alter habitats and directly harm important species such as coral (Martinez 2012a, Martinez 2012b, Smith et al. 2006, McCook et al. 2001). The prevention of additional stressors such as introduced species directly benefits the ecosystems, habitats and native species of Maunalua Bay.

Community, NGOs, state and federal government agencies have made efforts for over a decade to improve the health of the Maunalua Bay and restore the ecosystem. Of particular note, the community organization Mālama Maunalua has taken steps to address the growth of invasive algae species in the bay. Mālama Maunalua has engaged in efforts to remove alien species en masse, replant native species and monitor the efficacy of these habitat restoration efforts. To restore native fish populations, Mālama Maunalua educates ocean users on sustainable harvest with the goal of establishing a community-based marine co-managed area in the bay (Mālama Maunalua 2009). The proposed regulation would enhance these efforts. The regulation to prohibit introduced species would also prevent introduction of harmful species that would overgrow, damage or degrade maritime heritage resources.

The proposed regulation would enhance existing management authorities in Maunalua Bay. Existing management authorities in Maunalua Bay are described in the previous section. A complete description of regulatory authorities prohibiting introduced species in the marine environment surrounding the populated Hawaiian Islands is presented in Appendix F.

9.5. Alternative 4

Alternative 4 proposes the same actions as Alternative 2 and 3, with the addition of extending the regulations that apply to Penguin Bank, Maui Nui, and Maunalua Bay to the entire sanctuary. Therefore, the environmental impacts would be the same as those presented in Alternative 2 and 3 with the only differences described below. Beneficial impacts to the ecosystem from Alternative 4 would result from strengthening the management of human activities, restricting activities with the potential to cause damage to the ecosystem, and fostering cooperative management with communities. The expanded scope would allow the sanctuary to better support collaboration with other marine resource management agencies to improve marine ecosystem resilience and the sustainability of marine resources through healthy ecosystems.

9.5.1. Regulations

9.5.1.1. Sanctuary-Wide Regulations

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

A sanctuary-wide regulation prohibiting taking or possessing any marine mammal, sea turtle, seabird, ESA-listed species or Hawai‘i Revised Statutes chapter 195D listed species, within or above the sanctuary would benefit the marine ecosystems around Hawai‘i. Hawai‘i is considered the most isolated group of oceanic islands in the world, and it possesses one of the most highly endemic, fragile, and endangered biota on Earth. Hawai‘i is home to more than 40% of the threatened and endangered species in the United States (Cox 1999). There are many threats to marine species in Hawaiian waters. Threats to humpback whales include entanglement, vessel collisions, acoustic disturbance, water quality, marine debris and invasive wildlife viewings. In addition, new information and emerging potential threats have been identified (i.e. ocean energy infrastructure, aquaculture, wildlife viewing with new technologies etc.) which may have unanticipated and potentially undesirable impacts. It has been shown that vessel traffic has a negative impact on humpback whale behavior. The short-term effects of vessel traffic on whales includes “horizontal avoidance behavior” consisting of faster swimming, followed by “vertical avoidance behavior” consisting of longer dive times (Baker and Herman 1989, Green 1990, Forstell et al. 1990). Other signs of harassment can include evasive swimming patterns, interruption of breeding, nursing, or resting activities, actions by a female humpback whale to shield a calf from a boat or human behavior, or even abandonment of a previously frequented area (NMFS 2013). Because take of marine species includes harassment and disturbance of those species, the proposed sanctuary-wide take and possess prohibition could diminish these impacts to whale behavior caused by human interaction.

Vessel strikes to humpback whales are relatively common (Laist et al. 2001). In instances of vessel strikes to large-whales, important factors contributing to the seriousness of the vessel strike are the size of the vessel and the speed at which the vessel is traveling at the time of the strike. Larger vessels are more likely to inflict lethal and serious injuries while vessels traveling at 14 knots or faster cause the most severe and lethal injuries (Laist et al. 2001).

Prohibiting taking or possessing humpback whales, marine mammals, sea turtles, seabirds, ESA-listed species or Hawai‘i Revised Statutes chapter 195D listed species would have a positive

impact on these species. The regulation provides an additional level of protection for marine species due to increased deterrence and compliance with regulations in place to protect them from potentially harmful take. Under the NMSA, the sanctuary would be able to pursue civil violations of any action of taking or possessing protected species within the sanctuary. Since take of these species includes harassment and disturbance of behavior, the sanctuary could also prosecute activities that would harm or impact behavior including invasive wildlife viewing, touching, and feeding. Although Section 7(a) of the ESA requires consultations on federal actions which may affect endangered species or their critical habitats, this only applies to activities authorized, funded, permitted, or carried out by federal agencies, not to direct private or state actions and does not fully prevent degradation of those habitats. The NMSA would provide an additional legal mechanism for prosecution, which could minimize the take or possession of marine species in the sanctuary.

The regulation is unlikely to have a significant impact on vessel traffic since enforcement records indicate that there has been no major impact on vessel traffic or operations from MMPA or ESA marine mammal take regulations. Likewise, the regulation would not have a significant impact on fishing activities or offshore development. The regulation may have a minor impact on recreational wildlife viewing since invasive wildlife viewing, touching, and feeding would be prohibited. However many tour operators already comply with existing regulations as well as existing voluntary wildlife viewing standards to mitigate potentially harmful impacts to marine mammals. The regulation could also have a minor impact on research and monitoring as well as certain education activities that involve approaching and interacting with protected species. However, as with tour operators, most research and education activities occurring in Hawai‘i already comply with existing federal and state regulations as well as voluntary wildlife viewing standards.

Currently, attempts to approach marine mammals (i.e., Hawaiian spinner dolphins) can be considered a “take” under the MMPA, thereby making such activities illegal (National Marine Fisheries Service 2007). Specifically, the MMPA defines “take” as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” and defines “harassment” as “any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]” (NMFS 2007).

The regulation would enhance management activities that the sanctuary is proposing in the *Understanding and Managing Species and Habitats Action Plan*. The sanctuary plans to coordinate with federal and state agencies as well as other stakeholders on management and understanding of priority threats and resources as well as habitat threat reduction and mitigation. In addition the sanctuary would support the implementation of NOAA and State of Hawai‘i priorities for the management of protected marine resources through collaboration and use of planning documents.

Action: Add new prohibition on discharges

A sanctuary-wide regulation prohibiting discharging or depositing any material or matter into the sanctuary, or adjacent to the sanctuary if that discharge subsequently enters the sanctuary and injures a sanctuary resource would have a positive impact on water quality. Water quality in Hawai‘i ranges from relatively clean to somewhat impaired. In 2012, the State of Hawai‘i Department of Health reported 225 impaired marine segments in Hawai‘i including 23 on Kaua‘i, 73 on O‘ahu, 3 on Moloka‘i, 7 on Lāna‘i, 76 on Maui, and 43 on Hawai‘i (Hawai‘i Department of Health 2012). In 2012, turbidity was the most common pollutant in triggering a listing for marine water impairment, possibly due to polluted runoff. Nearshore localized concentrations of pollutants occur near populated areas due to stormwater discharges and permitted sanitary outfalls. Overall coastal water quality in Hawai‘i is rated “good” through the Water Quality Index (Environmental Protection Agency 2012) and sediment quality index is rated “poor” by 2006 surveys. Overall condition of waters including water quality and sediment quality is rated “fair.” This rating is lower than the “good” rating assessed in 2002 surveys reported in 2008 (Environmental Protection Agency 2012). The State of Hawai‘i Department of Health aims to make measurable improvements to its polluted runoff control program by focusing on selected watersheds (Hawai‘i Department of Health 2012).

Good water quality is essential to most marine species and habitats. It is important to maintain good water quality where existing and improve impaired water quality where needed for the health of the ecosystem and sanctuary resources. Poor water quality caused by runoff can have a negative impact on coral reefs. Excess nutrients in the coral reef habitat can cause algal or microbial blooms, which can smother the reef, damaging and possibly killing coral. Elevated land based nutrients are suspected to exacerbate the green sea turtle (*Chelonia mydas*) disease fibropapillomatosis (Van Houtan et al. 2010). Pathogens released into the water can spread disease to coral and coralline algae and possibly fish, invertebrates, turtles and marine mammals (Aeby 2005; 2006). Since both Hawaiian spinner dolphins and humpback whales inhabit nearshore areas including shallow coves and bays, their habitat is especially threatened by coastal pollution, runoff, and sediment discharge (NMFS 2006).

The discharge and enter and injure prohibitions would have a direct, long-term, beneficial impact on physical resources (i.e., water quality) because it would prohibit potentially harmful discharges by introduction of pollutants, such as bacteria, viruses, solids, pharmaceuticals, organics, nutrients, and metals. The regulation would minimize the introduction of foreign substances and pathogens into the sanctuary improving water quality and coral reef habitat and protecting particularly sensitive habitat. Excess nutrients in the coral reef habitat can cause algal blooms, which can smother the reef, damaging and possibly killing coral. Pathogens released into the water can spread disease to coral and coralline algae and possibly impact fish, invertebrates, turtles and marine mammals (Aeby 2005; 2006). The discharge prohibition also limits the exposure of fish, invertebrate species, turtles and marine mammals to hazardous substances, including pathogens, excess nutrients, and turbidity.

The regulation supports implementation of the Clean Water Act, the Ocean Dumping Act, the Rivers and Harbors Act, the Marine Plastic Pollution Research and Control Act, the Marine Debris Research Prevention and Reduction Act, and State of Hawai‘i Department of Health water quality standards (see box). Additionally, the regulation provides an additional legal

mechanism for prosecution, which should help to dissuade this activity in the sanctuary under the NMSA. The prevention of unexpected discharge in the sanctuary benefits the environment by preventing major stressors from occurring.

The discharge and enter and injure prohibition may require that ocean users employ other methods to safely discharge materials inside and outside of the sanctuary. This regulation should not interfere with current on-the-water activities within the sanctuary. Any impact to recreation and tourism, research and monitoring, or education should be less than significant. The prevention of discharge may benefit the human environment by improving the aesthetic quality and health of the marine environment, supporting better water quality for those species that are also important for tourism and non-use values. Under NMSA there would be greater enforcement capabilities and resources to protect and enhance water quality. Legal penalties available under NMSA include civil penalties for violations, and assessment of response costs and monetary damages for injuries to sanctuary resources.

The regulation supports several proposed management activities in the draft management plan. The *Water Quality Action Plan* outlines several activities the sanctuary intends to implement to address water quality issues. The sanctuary intends to work with the State of Hawai‘i and other water quality managers to ensure the protections outlined in the State Water Quality Standards are implemented in sanctuary waters. To achieve long-term improvements in water quality, the sanctuary intends to engage appropriate authorities and local businesses to develop best practices on responsible garbage and sewage disposal methods and locations. To improve understanding on the impacts of discharge to sanctuary water quality, the sanctuary would engage scientific experts to identify water quality related research and monitoring, and document and assess entanglements of humpback whales in marine debris.

Action: Add new prohibition on the disturbance of submerged lands

A sanctuary-wide regulation prohibiting dredging, drilling into, or otherwise altering in any way submerged lands would have a positive impact on the biophysical environment. Alteration of submerged lands can damage unique habitats and species. Harbor expansion, nearshore construction, dredging, sand mining, and the laying of pipes, cables and mooring buoys on the ocean floor can result in the disruption or displacement of habitat and increased turbidity levels. Seafloor structure originating from coral reef organisms is produced at slow rates and is predicted to slow and eventually disintegrate from ocean acidification due to increased carbon that is being emitted into the atmosphere and absorbed by the oceans.

A prohibition against altering submerged lands seeks to enhance existing regulatory authorities in Hawai‘i. Altering submerged lands is currently regulated under both state and federal authorities. NOAA Fisheries prohibits any person from taking any stony coral, or to break or damage any stony coral with a crowbar, chisel, hammer, or any other implement. The State of Hawai‘i prohibits intentional or negligent large-scale damage to stony coral and live rock, such as by vessel groundings, introduction of sediments, biological contaminants, and other pollutants. It also prohibits the take, break, or damage of any stony coral or live rock. It is also unlawful to sell stony coral or live rock (Haw. Adm. Rul. § 13-95 Amended). Stony corals are defined as any species belonging to the Order *Scleractinia* (marine corals which generate a hard skeleton) that are native to the Hawaiian Islands. All reef corals, including mushroom corals,

belong to this order. Live rock is defined as any natural hard substrate to which marine life is visibly attached or affixed. Virtually every hard substrate in nearshore waters has something living attached to it. In addition, Hawai‘i Water Quality Standards define activities that are permissible in specific marine bottom ecosystems (for a complete list of Class I and Class II State of Hawai‘i defined marine bottom ecosystems in Hawai‘i see Appendix G). It is the intention that Class I marine bottom ecosystems remain as close to their natural pristine state with an absolute minimum of pollution from any human-induced source. Uses of marine bottom ecosystems in this class are passive human uses without intervention or alteration, allowing the perpetuation and preservation of the marine bottom in a most natural state, such as for nonconsumptive scientific research (demonstration, observation or monitoring only), nonconsumptive education, aesthetic enjoyment, passive activities and preservation. All uses of Class II marine bottom must be compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation. Any action which may permanently or completely modify, alter, consume, or degrade marine bottoms, such as structural flood control channelization, (dams); landfill and reclamation navigational structures (harbors, ramps); structural shore protection (seawalls, vestments); and wastewater effluent outfall structures may be allowed upon securing approval in writing from the Director of DLNR, considering the environmental impact and public interests (Haw. Adm. Rul. §11-54).

The prohibition against altering submerged lands allows sanctuary management to more effectively protect bottom habitat within sanctuary waters. The regulation would enhance existing regulatory authorities by supplementing enforcement of violators and strengthening compliance with the terms and conditions of required leases, permits or licenses. The natural resource damage assessment clause of the NMSA (Section 312) provides for the protection of sanctuary resources by making any person who destroys, causes the loss of, or injures any sanctuary resource liable for an amount equal to the amount of response costs and damages resulting from the destruction, loss, or injury. The sanctuary could apply damages to restoration efforts to restore, replace, or acquire the equivalent of any sanctuary resources. The sanctuary could engage appropriate state and federal agencies to assist in the implementation of any restoration activities. This action would result in a positive impact to benthic habitat, including coral reefs, throughout sanctuary waters.

The regulation could have a minor negative impact on research and education in the sanctuary. Collecting seafloor samples can sometimes involve bottom trawling, dredging and other collection methods that could impact submerged lands. Geologists collect rock samples using submersibles or dredge hauls, among other methods, to study undersea volcanoes (Garcia et al 2012, Templeton et al 2009). Some education programs harvest corals and live rock for instructional purposes. However researchers and educators would all be able to apply for research and education permits to conduct activities within the sanctuary that alter submerged lands. This regulation could also have a minor impact on recreation and tourism because artificial reefs, including intentionally sunken ships and planes, are created as recreational and tourist attractions (Tune 1997). In addition to improving fishing practices in Hawai‘i, artificial reefs have become popular tourist attractions for SCUBA divers and submarine tours. Additionally, recreational tours sometimes anchor on coral or sensitive substrates when a mooring or sandy bottom is unavailable. Tour operators may have to modify some of their practices to adhere to the regulation.

The regulation could potentially impact wind developers proposing offshore wind farms. No current offshore wind projects are in development in Hawai‘i but the State has the highest percentage of wind potential in the nation with 17% of the US offshore wind resources (Offshore Wind Energy 2013). The strongest wind areas are located between the islands of Hawai‘i and Maui, Maui and Lāna‘i, and Lāna‘i and Moloka‘i. In 2012, the Bureau of Ocean Energy Management (BOEM) established the Hawai‘i Outer Continental Shelf (OCS) Renewable Energy Task Force to support the development of offshore renewable energy projects.

The regulation could potentially impact ocean energy projects that require anchoring to the seafloor and undersea cables connecting them to land. Several ocean energy technologies have been piloted and proposed in Hawai‘i in the last ten years. Buoys that harness wave energy, such as the PowerBuoys deployed in Kāne‘ohe Bay by the Office of Naval Research, require mooring to the seafloor and connection to the shore through undersea cables (Gill 2012, Ocean Energy). Oscillating water column (OWS) technologies, such as Oceanlinux’s proposal for a stationary platform 1000-2000 feet off Pa‘uwela connected to a shore station by undersea cable, would similarly require altering submerged lands (Ocean Energy). Ocean Thermal Energy Conversion (OTEC) projects have been piloted by the Natural Energy Laboratory of Hawai‘i Authority involving shoreline facilities that connect to cold, deep ocean water that would require additional permitting under this regulation (Ocean Energy).

As outlined in the State Energy Policy’s second directive, connecting the Hawaiian Islands through integrated, modernized grids is critical to meeting the State of Hawai‘i energy goals. However, the route for any underwater cable has not been officially determined. If the preferred route transects the sanctuary, the utility company would have to apply for a permit from the appropriate authorities for the construction, operation and maintenance of a submerged cable. As the installation of a submarine cable would violate the prohibition on disturbance of submerged lands, the applicant would need to apply for a general permit for the installation of a submarine cable. The permit applicant’s project would need to comply with all permit review procedures and criteria, including a requirement the cable project be pre-approved by the State of Hawai‘i. ONMS would consider project-specific environmental effects and compliance responsibilities at the time of permit application review. In addition, ONMS could issue a special use permit for the ongoing operation and maintenance of a submarine cable if the project is determined to be consistent with section 310 of the NMSA.

Any entity (public or private) trying to establish an artificial reef or fish aggregation devices (FAD) in Hawai‘i must get a permit from the U.S. Army Corp of Engineers. Sanctuary management are proposing to be able to authorize other authorities’ permits so FADs and artificial reefs should not be impacted within the sanctuary. FADs and artificial reefs have been shown to concentrate fish populations, benefiting fishermen. Artificial reefs can be constructed from a variety of materials including derelict cars and barges but are now mainly built with concrete blocks called “z-modules” (Artificial Reefs 2013). FADs are built like moorings with concrete blocks anchoring them and a buoy floating above (Hawai‘i FAD Program 2013). Artificial reefs can enhance species diversity by up to 5 times and fish biomass by up to 20 times that of the previous habitat (Artificial Reefs 2013). There are 30 to 40 FADs deployed around the islands of Hawai‘i, Maui, O‘ahu and Kaua‘i (Hawai’i FAD Program 2013). There are five artificial reefs constructed by the Department of Aquatic Resources (DAR) across the State

located at Kualoa, Maunalua Bay, Ewa Deepwater, and Waiʻanae on Oʻahu and Keawakapu on Maui (Artificial Reefs 2013).

The regulation recognizes legally permitted aquaculture activities so they would not be impacted by the proposed regulation. Several state and federal agencies regulate the construction of aquaculture facilities such as the U.S. Army, the Hawaiʻi Office of Conservation and Coastal Lands and the Hawaiʻi Office of Environmental Quality Control. In 2005, there were three commercial mariculture developments in Hawaiʻi. In 2011, total aquaculture sales were $40 million. The first open ocean aquaculture project in the U.S. was the Cates International Inc. Pacific threadfin (moi) farm off Ewa Beach leased in 2001. Black Pearl Inc. (BPI) tried to lease 75 acres near the Honolulu Airport for farming pearl oysters in 2005 but the lease was still pending. The same owner of BPI also started Kona Blue Water Farms, which formed a farm within the sanctuary off Kailua-Kona to raise amberjack (kahala) and moi.

The regulation is supported by management activities proposed in the *Understanding and Managing Species and Habitats Action Plan*. The sanctuary plans to implement research and science activities at priority sites within the sanctuary to monitor change to facilitate options for not anchoring on hard substrate. Furthermore, the sanctuary plans to coordinate with the State of Hawaiʻi to develop and implement a day-use mooring buoy plan and buoy placement within the sanctuary to help minimize impacts to coral reef habitat and the seafloor. To educate ocean users on the purposes and benefits of protecting the seafloor, the sanctuary plans to collaborate with state and federal agencies to conduct watercraft user education courses on best management practices.

Action: Add new prohibition on use of explosives

A sanctuary-wide regulation prohibiting possessing or using explosives within the sanctuary could have a positive impact on the biophysical environment. Explosives have a negative impact on biological and physical resources in the marine environment. Explosives may cause blast trauma and injury to marine animals, depending on size and distance (Ketten 1995). Explosives can kill and maim marine organisms as well as destroy coral reef habitat proportional to power of and radius from the explosion. In close proximity, explosions have been shown to kill marine species (U.S. Navy 2012). At a farther distance, an explosion in Newfoundland was found to harm the ear bones in nearby humpback whales (Ketten et al. 1993).

Fireworks exploded over the sanctuary can cause light pollution, which has been shown to affect the behavior of marine species. In a study on the effects of artificial light on leatherback turtles in Gabon, holiday fireworks contributed to disorientation of nesting turtles (Deem et al., 2007). Fireworks may also have a negative impact on seabirds that feed at night.

Firework displays over water can contribute paper and cardboard and wood marine debris to the marine environment below (Cheshire et al. 2009). In addition, a variety of contaminants can enter the marine environment through the debris and fallout fireworks produce. Some of the common elements released in firework displays include barium, copper, cadmium, lithium, rubidium, strontium, and lead (Antony 2011). Elevated levels of hexachlorobenzene, used for combustion in fireworks, was found to have a negative impact on number of species and diversity of microbial communities in the Fuhe River in China (Liu et al. 2007). Firework

displays can also augment the concentrations of perchlorate in nearby water supplies (Aziz et al. 2006). Perchlorate can block thyroid function, which influences fish reproductive systems. Exposures as little as 31,000 ppb induced responses in thyroid activity in goldfish but its effects on reproductive system were inconclusive (Crouch and Synder 2013). Additionally, light pollution from fireworks can also affect marine species. In a study on the effects of artificial light on leatherback turtles in Gabon, holiday fireworks contributed to disorientation of nesting turtles (Deem et al. 2007).

Behavioral, physiological, and acoustic changes can occur in various marine organisms as a result of ocean noise. These changes have the potential to negatively impact individuals, populations, and ecosystems. Fish have been documented to experience auditory threshold shifts, especially when exposed to noise in their most sensitive hearing ranges (Scholik and Yan 2001). Physical trauma has been documented in the ears of fish exposed to air-guns used in marine petroleum exploration (McCauley et al. 2002). A reduction in growth and reproduction rates and an increase in aggression and mortality rates has been found in shrimp exposed to prolonged high sound levels (Lagardére 1982). A study on Caribbean hermit crabs showed that crabs in environments with motor boat noise allowed predators to approach more closely before they hid (Chan et al. 2010).

The regulation prohibiting explosions in the sanctuary would enhance existing state regulations in Hawai‘i. The State of Hawai‘i restricts the use of firearms and spears in the marine environment and altogether prohibits the use of explosives in catching fish. Spearfishing is limited for certain species by size, season and other restrictions. Spearing turtles, aquatic mammals or crustaceans is prohibited with the exception of introduced freshwater prawns (Haw. Adm. Rul. §13-75, Haw. Rev. Stat. §188-23). The State of Hawai‘i also prohibited the use of firearms to catch, attempt to catch or kill fish, crustaceans, mollusks, turtle, or marine mammals with the exception of sharks and gaffed tuna and billfish. Explosives, electro-fishing devices, and noxious chemicals are both unlawful to use in fishing and unlawful to possess in the vicinity of fishing activities (Haw. Adm. Rul. §13-75, Haw. Rev. Stat. §188-23).

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Prohibiting the use of explosives in the sanctuary would have a minimal impact on fishing practices. The possession and use of explosives are already prohibited in or around fishing areas by the State of Hawai‘i (Haw. Adm. Rul. **§**13-75, Haw. Rev. Stat. §188-23). The sanctuary’s prohibition would apply a higher penalty schedule to these violations. The use of explosives can have detrimental impacts to human health and safety. In addition to the physical harm incurred at close proximity to explosions, explosives can have impacts to water quality such as perchlorate

contamination, which has been found in nearby water after firework events and affects mammary gland for breastfeeding in humans (Sugimoto et al., 2012). Therefore, the prohibition of explosives could have a beneficial impact on human health and safety.

Prohibiting the use of explosives in the sanctuary could impact offshore development in the case that explosives are used in construction. It could affect the construction of the undersea cable being discussed by the HECO and PUC. Fireworks, as a form of explosive, would be prohibited under this regulation so there could be a minor impact to fireworks users who plan to hold displays over the sanctuary.

The proposed regulation would enhance management activities outlined in the sanctuary draft management plan. The *Sustainable Use Action Plan* includes several activities to engage ocean users in best management practices on sustaining marine resources. Some of this outreach material could include dissuading ocean users from employing explosives through educational materials on the harm that explosives cause to marine resources. For instance, the sanctuary would offer customized training for businesses and tour operators who carry out activities within and adjacent to the sanctuary and would also incorporate messages of sustainable use into various outreach materials, which could include the harm caused by explosives on marine life.

Action: Add new prohibition on introduction of introduced species

A sanctuary-wide regulation prohibiting introducing or otherwise releasing an introduced species into the sanctuary could have a positive impact on the biophysical environment. The State of Hawai‘i considers introduced species (also known as Aquatic Invasive Species) to be those species in marine and inland waters whose introductions cause or are likely to cause economic or environmental harm, or harm to human health (Shluker 2003). With respect to invertebrates, it is estimated that 201 marine and brackish invertebrate species have been introduced to Hawai‘i, and 86 additional species cannot be determined to be native or introduced. Of these species, 248 have become established. Like recent fish introductions, most of these invertebrates probably arrived through ballast water and hull fouling (Shluker 2003). At least 19 species of macroalgae have been introduced to Hawai‘i since the mid 1950’s. At least five have established and dispersed around the Hawaiian Islands and in some areas, they appear to be outcompeting native benthic species. Three species, *Gracilaria saliconia*, *Hypnea musciformis*, and *Kappaphycus* spp., form extensive destructive blooms. In some areas, invasive algae have invaded coral habitat and overgrown reef building corals. Algal blooms can overgrow and subsequently kill coral by smothering, shading and abrasion. This can lead to a decrease in organism diversity and physical degradation of reefs. Also, 34 marine fishes have been introduced to Hawai‘i’s waters and at least 20 have become established. Of these species, 13 were purposeful releases and seven were accidental introductions. Ta‘ape (blueline snapper, *Lutjanus kasmira*) and roi (peacock grouper, *Cephalopholis argus*) were introduced by the State of Hawai‘i as food fishes in the late 1950’s. These fish are widely considered by the public to be affecting native populations, but further research is needed to better understand the impacts of these fish. Prior to 1960, most fish introductions were purposeful, but since then, most are likely to be related to shipping (ballast water or hull fouling) or to the aquarium trade.

Introduced species have adversely affected more than 45 percent of listed threatened or endangered species in the United States. After habitat modification and loss, introduced species

are the third leading cause for species extinction (Wilcove et al. 1998, Kimball 2001, U.S. General Accounting Office 2002), with the rate of extinctions higher on islands than anywhere else in the world (South Pacific Regional Environment Programme 2000). There are many problems caused by introduced species that are of concern for Hawai‘i’s marine ecosystems including competition for resources and habitat destruction (Shluker 2003). There are a number of obstacles to introduced species management in the Pacific Islands region, including limited and inaccessible scientific information on basic biology for risk assessment and management, lack of awareness of invasive species impacts on biodiversity, insufficient mechanisms for information dissemination to relevant decision-makers, lack of well-developed regional coordination, and a shortage of technically trained personnel and necessary facilities, as well as insufficient funding to support the above (SPREP 2000).

A regulation prohibiting introducing species into the sanctuary would complement and enhance existing federal and state efforts to control introduced species in marine environments. The State of Hawai‘i prohibits the introduction or spread of species within state waters including Haw. Adm. Rul. § 4-76 (Non-Indigenous Aquatic Species) including discharge of ballast water and has permitting requirements. NOAA Fisheries and the State of Hawai‘i Department of Agriculture issue permits when mariculture ventures include non-indigenous species. In addition, the State of Hawai‘i also has an Aquatic Invasive Species Management Plan 2003.

A regulation prohibiting introducing species into the sanctuary would benefit marine species by decreasing threats from introduced species. Introduced species can out-compete native plants for resources (Smith et al. 2002, Martinez 2012). On coral reefs, introduced predatory species can decimate juvenile populations of native species and outcompete adults for resources and habitat (*e.g.* Albins and Hixon 2008). Introduced algae have also been shown to out-compete coral reefs for nutrients. In other instances, an introduced species can directly or indirectly alter physical habitat quality. For example, red mangrove roots have been shown to destroy Hawaiian fishpond walls and accumulate sediment and nutrients in coastal areas, altering the habitat for native species. Introduced species can also be vectors for disease that can harm and eventually kill native species. The introduced blue-line snapper spread disease to indigenous Hawaiian goatfish, severely impacting the species. The regulation would also provide an additional legal mechanism for prosecution of violators under the NMSA. The prevention of unpermitted introduced species from being released into the sanctuary benefits the environment by preventing a major invasion from occurring.

The introduced species prohibition may impact vessels that transport introduced species or equipment that may be contaminated by introduced species. However, it is likely that most transport vessels are taking the necessary precautions since regulations already exist in state waters. The regulation would not impact mariculture activities that have permits from NOAA Fisheries or the State of Hawai‘i. The regulation could indirectly benefit recreation and tourism by improving the aesthetic quality of the marine environment for recreational snorkelers and divers by preventing introduced algae invasions. Additionally, the regulation could have a positive indirect impact on fishing activity by reducing competition for native fish species in Hawai‘i. The regulation is not likely to have an impact on research and monitoring or education activities that take place within the sanctuary.

The proposed regulation would compliment management activities outlined in the sanctuary draft management plan. In the *Understanding and Managing Species and Habitats Action Plan*, the sanctuary plans to evaluate and prioritize opportunities for the sanctuary to further support efforts to minimize the impacts of aquatic invasive species. Additionally, since invasive species are often spread through human use, activities in the *Sustainable Use Action Plan*, such as identifying significant impacts of cumulative human use in the sanctuary and offering customized training for businesses and tour operators would also help to address the spread of invasive species. In Maunalua Bay, which has been particularly affected by invasive algae, the sanctuary plans to collaborate with researchers, natural resource managers and communities to assess the impacts of stressors such as invasive species.

9.5.2. Boundary Change

Incorporating the estuarine waters of the Hanalei River into the sanctuary on the north shore of Kauaʻi would have a positive impact on the biophysical envioronment. The physical habitat and marine species at the mouth of the Hanalei River would benefit from inclusion in the sanctuary as a result of the sanctuary's shift to ecosystem-based management. In the *Understanding and Managing Species and Habitats Action Plan*, activities are planned to monitor and protect habitats. The Hanalei River estuary provides a breeding area for several fish species and is home to the five goby species native to Hawaiʻi. In this plan, a variety of marine species within the sanctuary would be considered in research, monitoring and protection, which would have a beneficial impact on the ecosystem as a whole. Under Alternative 4, the prohibition against dredging, drilling into, or otherwise altering in any way the submerged lands would apply to the Hanalei River and help protect benthic habitat for marine species within the Hanalei River. The prohibition against releasing introduced species into the sanctuary would also benefit native species that inhabit the Hanalei River.

The *Water Quality Protection Action Plan* outlines several activities that would improve the water conditions throughout the sanctuary, including the boundary extension to include Hanalei River. These activities include partnering with other organizations and agencies on monitoring, pollution and debris reduction, and outreach on water quality issues. Additionally, under Alternative 4, the prohibitions against discharge would extend sanctuary-wide and therefore provide an additional level of protection to the Hanalei River. Specifically, it would be prohibited to discharge or deposit any material within the sanctuary, or outside of the sanctuary if the material subsequently enters and injures a sanctuary resource within the sanctuary.

The cultural and historic practices and resources in this boundary addition, including native goby species and wetlands for traditional taro farming, could benefit from inclusion in the sanctuary. Traditionally, gobies were an important resource used in ceremonies and fishing events. Taro was also a culturally significant resource in riparian wetlands around Hanalei River. The cultural practices of maintaining and harvesting these resources could benefit from the inclusion of this boundary addition as a result of the support lent to cultural perpetuating through the *Living and Evolving Cultural Traditions Action Plan*. This action plan includes activities to gather information and incorporate cultural knowledge into management, including coordinating with partners to assess and protect coastal and reef freshwater springs, estuaries, sea caves, and anchialine ponds within or adjacent to the sanctuary, recognizing their significance as wahi pana and sites of cultural practice. These activities are not expected to impact the actual practice of

cultural traditions within the sanctuary; however increased knowledge of cultural practices is the first step to providing appropriate protection. The sanctuary-wide prohibition of removing, damaging, or tampering with any historical or cultural resource would apply to the Hanalei River under Alternative 4, and serve to enhance the proposed management activities.

The inclusion of the Hanalei River in the sanctuary could have a beneficial impact on education and outreach in the area. Several of the action plans include education and outreach activities that could contribute to education in the area. In particular, the *Ocean Literacy Action Plan* outlines sanctuary-wide education activities, such as expanding the Ocean Awareness Training program, teacher trainings and student internship opportunities. The river currently lacks the proper infrastructure to support growing visitor populations. Without proper education, visitors could pollute the area and engage in recreational activities in that impact the biology of the Hanalei River. Therefore, human health and safety, through education, in the area could also benefit from being included in the sanctuary.

Including this section of the Hanalei River in the sanctuary could have a beneficial impact on research and monitoring activities in the area. The *Understanding and Managing Species and Habitats* action plan includes several activities that could conduct and support research in the sanctuary. Specifically, citizen science programs, pilot research projects and behavior pattern studies sanctuary-wide contribute to the body of research in the region.

Resource Impacts Comparison Table

Legend
+ = Significant beneficial impact
O = No impact
⊙ = Less than significant adverse impact
− = Significant adverse impact.

Resources	Proposed Alternatives			
	One	Two	Three	Four
Physical and Biological Environment				
Habitats	O Status Quo Maintained	+ Understanding and Managing Species and Habitats Action Plan & Resilience to a Changing Climate Action Plan should provide habitat protection in the sanctuary and in proposed boundaries on Oʻahu, Kauaʻi & Niʻihau; Pīlaʻa Action Plan & Niʻihau Action Plan should provide habitat protection; Regulations prohibiting discharge, altering submerged lands, explosives, and introduced species should provide additional protections for habitats in Penguin Bank and Maui Nui area.	+ Understanding and Managing Species and Habitats Action Plan & Resilience to a Changing Climate Action Plan provide habitat protection; Regulations prohibiting discharge, altering submerged lands, explosives, and introduced species should provide additional protections for habitats in Penguin Bank, Maui Nui area, Maunalua Bay.	+ Understanding and Managing Species and Habitats Action Plan & Resilience to a Changing Climate Action Plan should provide habitat protection for the the Hanalei River; Regulations prohibiting discharge, altering submerged lands, explosives, and introduced species should provide additional protections for habitats throughout the Sanctuary.

Resources	Proposed Alternatives			
	One	Two	Three	Four
Marine Species	O Status Quo Maintained	+ Understanding and Managing Species and Habitats Action Plan & Resilience to a Changing Climate Action Plan should benefit marine species in the sanctuary and in proposed boundaries on Oʻahu, Kauaʻi & Niʻihau; Niʻihau, Pīlaʻa & Maunalua Action Plans should provide additional benefits; Regulations prohibiting approach, overflight, take & possession, discharge, altering submerged lands, explosives, and introduced species, should provide additional protection for marine species in Penguin Bank and Maui Nui area.	+ Understanding and Managing Species and Habitats Action Plan & Resilience to a Changing Climate Action Plan should benefit marine species; Regulations prohibiting approach, overflight, take & possession, discharge, altering submerged lands, explosives, and introduced species, should provide additional protection for marine species in Penguin Bank, Maui Nui area, Maunalua Bay.	+ Understanding and Managing Species and Habitats Action Plan & Resilience to a Changing Climate Action Plan should benefit marine species in the Hanalei River; Regulations prohibiting approach, overflight, take & possession, discharge, altering submerged lands, explosives, and introduced species, should provide additional protection for marine species throughout the Sanctuary.
Water Quality	O Status Quo Maintained	+ Water Quality Protection Action Plan should benefit water quality in the sanctuary and proposed boundaries on Oʻahu, Kauaʻi & Niʻihau; Māʻalaea Action Plan should provide additional benefits; Regulations prohibiting discharge should improve water quality in Penguin Bank and Maui Nui area.	+ Water Quality Protection Action Plan should benefit water quality. Regulations prohibiting discharge should improve water quality in Penguin Bank, Maui Nui area, Maunalua Bay.	+ Water Quality Protection Action Plan should enhance water quality in the Hanalei River; Regulations prohibiting discharge should improve water quality throughout the Sanctuary.
Human Environment				
Economics	O Status Quo Maintained	+ Sustainable Use Action Plan & Ecosystem Benefits and Values Action Plan activities should provide economic benefits; Regulations enhancing sanctuary resources should increase the	+ Sustainable Use Action Plan & Ecosystem Benefits and Values Action Plan activities should provide economic benefits; Regulations enhancing sanctuary resources should increase the	+ Sustainable Use Action Plan & Ecosystem Benefits and Values Action Plan activities should provide economic benefits; Regulations enhancing sanctuary resources should increase the

Resources	Proposed Alternatives			
	One	Two	Three	Four
		economic value of Penguin Bank and Maui Nui area by preserving a healthy ecosystem.	economic value of Penguin Bank, Maui Nui area and Maunalua Bay by preserving a healthy ecosystem.	ecosystem value of the sanctuary by preserving a healthy ecosystem.
Cultural Resources	O Status Quo Maintained	+ Living and Evolving Cultural Traditions Action Plan should protect cultural resources in the sanctuary and in proposed boundaries on O‘ahu, Kaua‘i, & Ni‘ihau; Historical and cultural resources regulation should provide additional protections for cultural resources throughout the sanctuary.	+ Living and Evolving Cultural Traditions Action Plan should protect cultural resources; Historical and cultural resources regulation should provide additional protections for cultural resources throughout the sanctuary.	+ Living and Evolving Cultural Traditions Action Plan should protect cultural resources in proposed boundary in Hanalei River; Historical and cultural resources regulation should provide additional protections for cultural resources throughout the sanctuary.
Maritime Heritage Resources	O Status Quo Maintained	+ Maritime Heritage Action Plan extended should protect maritime heritage resources in the sanctuary and in proposed boundaries on O‘ahu, Kaua‘i, & Ni‘ihau; SSMA Action Plan should provide benefits to Ni‘ihau & Pīla‘a; Historical and cultural resources regulation should provide additional protections for maritime heritage resources throughout the sanctuary.	+ Maritime Heritage Action Plan should benefit maritime heritage resources; Historical and cultural resources regulation should provide additional protections for maritime heritage resources throughout the sanctuary.	+ Maritime Heritage Action Plan should benefit marine species in the Hanalei River; Historical and cultural resources regulation should provide additional protections for maritime heritage resources throughout the sanctuary.
Fishing Activities	O Status Quo Maintained	+ Understanding and Managing Species and Habitats Action Plan should benefit resources in the sanctuary and in proposed boundaries on O‘ahu, Kaua‘i, & Ni‘ihau.	+ Understanding and Managing Species and Habitats Action Plan should benefit resources.	+ Understanding and Managing Species and Habitats Action Plan should benefit resources in the Hanalei River.

Resources	Proposed Alternatives			
	One	Two	Three	Four
	O Status Quo Maintained	⊙ Regulations prohibiting discharge and altering submerged lands may cause minimal inconvenience to fisherman in Penguin Bank and Maui Nui area.	⊙ Regulations prohibiting discharge and altering submerged lands may cause minimal inconvenience to fisherman in Penguin Bank, Maui Nui area, Maunalua Bay.	⊙ Regulations prohibiting discharge and altering submerged lands may cause minimal inconvenience to fisherman throughout the sanctuary
Offshore Development	O Status Quo Maintained	⊙ Regulation prohibiting altering submerged lands may cause minimal inconvenience in Penguin Bank and the Maui Nui area.	⊙ Regulation prohibiting altering submerged lands may cause minimal inconvenience in Penguin Bank, Maui Nui area, and Maunalua Bay.	⊙ Regulation prohibiting altering submerged lands may cause minimal inconvenience throughout the sanctuary.
Recreation & Tourism	O Status Quo Maintained	+ Sustainable Use Action Plan should support opportunities for recreation and tourism within the sanctuary and within the proposed boundaries on Oʻahu, Kauaʻi, & Niʻihau; Regulations protecting water quality, habitats and marine species should improve marine environment for recreation and tourism in Penguin Bank and Maui Nui area.	+ Sustainable Use Action Plan should support opportunities for recreation and tourism; Regulations protecting water quality, habitats and marine species should improve marine environment for recreation and tourism in Penguin Bank, Maui Nui area and Maunalua Bay.	+ Sustainable Use Action Plan should support opportunities for recreation and tourism within the proposed boundary in Hanalei River; Regulations protecting water quality, habitats and marine species should improve marine environment for recreation and tourism throughout the sanctuary.
Education	O Status Quo Maintained	+ Ocean Literacy Action Plan should support opportunities for education.	+ Ocean Literacy Action Plan should support opportunities for education.	+ Ocean Literacy Action Plan should support opportunities for education.
Research & Monitoring	O Status Quo Maintained	+ Understanding and Managing Species and Habitats Action Plan should support opportunities for research and monitoring within the sanctuary.	+ Understanding and Managing Species and Habitats Action Plan should support opportunities for research and monitoring.	+ Understanding and Managing Species and Habitats Action Plan should support opportunities for research and monitoring.

Resources	Proposed Alternatives			
	One	Two	Three	Four
		⊙ Regulations prohibiting approach, take, and possession, should cause minimal inconvenience to researchers in Penguin Bank and Maui Nui area.	⊙ Regulations prohibiting approach, take, and possession, should cause minimal inconvenience to researchers in Penguin Bank, Maui Nui area and Maunalua Bay.	⊙ Regulations prohibiting approach, take, and possession, should cause minimal inconvenience to researchers throughout the Sanctuary.
Human Health & Safety	O Status Quo Maintained	+ Emergency Preparedness Action Plan ensures Human Health & Safety.	+ Emergency Preparedness Action Plan ensures Human Health & Safety.	+ Emergency Preparedness Action Plan ensures Human Health & Safety.

Table 40. Resources impacted by the proposed action and alternatives.

9.6. Protection of Children from Environmental Health and Safety Risks

In April 1997, President Clinton signed Executive Order (EO) 13045, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. The EO requires federal agencies to identify, assess, and address disproportionate environmental health and safety risks to children from federal actions. The proposed action and alternatives would not result in disproportionate negative impacts on children. Children may benefit from increased education opportunities offered by the sanctuary.

9.7. Environmental Justice

On February 11, 1994, President Clinton signed EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations*. The purpose of this order is to require federal agencies to identify and avoid disproportionate impacts on minority or low-income communities. Table 41 and Table 42 identify minority and low-income communities that could be affected by the proposed project. The proposed action and alternatives describe in this document would not result in any disproportionate negative impacts on environmental justice populations. Minority and low-income populations may benefit from place-based planning efforts that seek to integrate communities into sanctuary management planning.

Ethnicity	State total	City & County of Honolulu	Hawai'i County	Kaua'i County	Maui County
Caucasian	266,795	155,839	50,887	18,022	42,048
Black	7,694	6,384	984	113	214
Japanese	225,080	183,348	20,187	6,723	14,822
Chinese	40,153	37,462	818	908	965
Filipino	151,456	106,547	14,197	9,508	21,204
Korean	11,772	10,962	542	33	235
Samoan/Tongan	14,598	12,293	131	152	2,022
Mixed (except Hawaiian)[12]	286,797	208,871	36,976	13,069	27,880
Hawaiian/part Hawaiian	290,680	180,597	53,630	16,282	40,171

Table 41. Ethnicity as reported by individual by county (2010).
Source: *Hawai'i State Department of Health, Office of Health Status Monitoring (Hawai'i State Data Book 2011).*

Subject	State Total	Hawai'i	Honolulu	Kaua'i	Maui
High school graduate or higher	89.9%	90.2%	89.9%	89.9%	89.3%
With bachelor's degree or higher	29.5%	24.8%	31.9%	20.2%	24.9%

Table 42. Educational attainment of persons 25 years old and over by county (2010).
Source: *U.S. Census Bureau, 2010 American Community Survey 1-Year Estimates (Hawai'i State Data Book 2011).*

[12] Includes other ethnicities not listed, don't know, refused or missing (84,771).

9.8. Local Short-Term Uses of the Environment and Long-Term Productivity

NEPA requires consideration of the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. The short-term uses of the environment relating to No Action (Alternative 1) and Proposed Action (Alternative 3) alternatives would improve the health and quality of the marine environment by protecting marine habitat through regulations related to (1) vessel operations, including discharge, anchoring, and other regulations; (2) providing a mechanism through the NMSA to respond to groundings and hazardous spills, the introduction and spread of invasive species; and (3) monitoring human activities through regulations and non-regulatory programs that incorporate community involvement in the stewardship of sanctuary resources.

The long-term productivity related to the No Action and Proposed Action alternatives is based on the goals of the sanctuary and the suite of Action Plans structured to achieve these goals. This includes improving ecosystem-based management as a driving force for management-driven scientific research in Hawai‘i, fostering increased awareness and public stewardship of marine ecosystems through community engagement and education and outreach activities, understanding and addressing the impacts from climate change on the marine environment, and by fostering and facilitating cooperation among all stakeholders to build a shared vision and unified effort for the protection and long-term productivity of marine resources.

9.9. Irreversible and Irretrievable Commitments of Resources

NEPA requires an analysis of the extent to which the proposed project’s primary and secondary effects would commit nonrenewable resources to uses that future generations would be unable to reverse. The No Action and Proposed Action would require minor commitments of both renewable and nonrenewable energy and material resources for the management and research activities associated with the sanctuary. The sanctuary would also commit substantial resources, staff time, and funds for conservation and management activities. Nonrenewable resources that would be used during management and research activities include fuel, water, power, and other resources necessary to maintain and operate the vessels and the sanctuary office.

9.10. Cumulative Impact Analysis

A cumulative impact is an “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions” (40 C.F.R. §1508.7; NOAA 1999). Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 C.F.R. §1508.7).

The Council on Environmental Quality (CEQ) guidance for considering cumulative effects states that NEPA documents “should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant” (CEQ 1997). Projects considered below are similar to the proposed action, large enough to have far-reaching effects, or are in proximity to the proposed action with similar types of impacts.

9.10.1. Cumulative Methodology

For this section, past, present, and future foreseeable projects are assessed throughout Hawaii. Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects (CEQ 1997). The projects listed are either existing or are anticipated to occur in the reasonably foreseeable future (5 years) within Hawaii. The potential effects of these actions have been considered in combination with the impacts of the proposed action (alternative 3) to determine the overall cumulative impact on the resources.

9.10.2. Offshore Development

There are a number of offshore development projects considered here that could directly or indirectly impact the marine resources of Hawai‘i, although most will likely have no direct impact on the marine resources within the existing and proposed sanctuary boundaries. Offshore development is central to sustainable energy development in Hawai‘i. Over the last decade, several renewable ocean energy projects have been piloted or proposed in Hawai‘i. In Kāne‘ohe Bay, the Navy has deployed three moorings, called PowerBuoys made by Ocean Power Technologies, which capture wave energy and transmit electricity to shore through an underwater cable. The Environmental Assessment (EA) of the pilot project, prepared by the Navy in 2003, determined that the buoys in Kaneohe Bay would have no significant impact to the environment, considering the following resources: shoreline physiography, oceanographic conditions, marine biological resources, terrestrial biological resources, land and marine resource use compatibility, cultural resources, infrastructure, recreation, public safety, and visual resources. The EA cites such precautions as using an armored, shielded cable for underwater transmission to limit effects on marine life and an elevated land cable to avoid disturbing a burial site. By employing best management practices, the EA explains the project is unlikely to affect endangered species and may benefit benthic organisms by providing more substrate. No historical properties were found to be affected and recreation and human health and safety were found to be unaffected as well.

A 500-kW pilot project for an oscillating water column (OWC) ocean-wave energy converter developed by Oceanlinx has been proposed for Pa’uwela Point off Maui. The Natural Energy Laboratory Hawai‘i Authority on the island of Hawai‘i is host to Ocean Thermal Energy Conversion (OTEC) projects and other OTEC projects have been proposed off of O‘ahu (Gill 2013). No offshore wind projects have been proposed or developed but the State of Hawai‘i holds 17% of the nation’s wind resources with areas of high wind between the islands of Hawai‘i, Maui, Lāna‘i and Moloka‘i (Offshore Wind Energy, Renewable Energies 2013).

In 2011, the Hawaiian Electricity Company (HECO) released a request for proposal (RFP), as required by Hawai‘i Public Utilities Commission (PUC), for at least 200 MW of renewable energy to be supplied to O‘ahu and an undersea cable to connect O‘ahu’s electrical grid to other islands. In July of 2013, the PUC required HECO to remove the undersea cable RFP until it was determined that the proposed cable to run between Maui and O‘ahu on the seafloor was in the public’s interest (Renewable Energy and Undersea Cable System RFP 2013). In response, the State of Hawai‘i Department of Business, Economic Development and Tourism (DBEDT) released a report in September 2013 determining that the cable would cost $700 million and save ratepayers $425 million over 30 years (Yonan 2013). In late 2014 NextEra Energy, Inc. and Hawaiian Electric Industries, Inc. entered a merger agreement to promote affordable clean energy in Hawaii. NextEra Energy, Inc., has proposed a route from Honolulu Harbor to Mā‘alaea

Bay passing between Lānaʻi and Molokaʻi. The PUC has yet to approve the cable project (Yonan 2013).

9.10.3. Aquaculture

There are currently two aquaculture projects located within the sanctuary that could directly or indirectly impact the marine resources of Hawaii, although most will likely have no direct impact on the marine resources within the existing and proposed sanctuary boundaries. In 1999, Cates International launched a biconical sea cage, the SeaStation 3000 that produced 70,000 Pacific threadfin fingerlings (aka moi) for sport fishing (Davidson 2006). Currently, Blue Ocean Mariculture supports an active aquaculture farm near Kona, Hawaiʻi. Their hatchery facility is located at the Natural Energy Laboratory of Hawaii Authority (NELHA). They produce Hawaiian Kampachi™ for distribution in Hawaiʻi and the U.S. mainland. The State of Hawaiʻi operates a loan program to encourage the development of additional aquaculture initiatives in the marine environment.

If not managed and operated correctly, aquaculture has the potential to negatively impact the marine environment. Open water aquaculture can degrade water quality, spread parasites and diseases, and cause negative interactions with other marine species. Aquaculture activities authorized under a permit issued by the State of Hawaiʻi Department of Land and Natural Resources, the State of Hawaiʻi Department of Health, the U.S. Army Corps of Engineers, or the National Marine Fisheries Service are exempt from sanctuary regulations prohibiting dredging, drilling into, or otherwise altering in any way the submerged lands. Thus the proposed action will not contribut to the impacts of aquaculture activities.

9.10.4. Marine Traffic and Transportation

Hawaiʻi has six commercial harbors that support the shipment of goods and passengers to and between the populated Hawaiian Islands. The primary ports include Honolulu, Barbers Point, Hilo, Kawaihae, Kahului, and Nawiliwili. Pearl Harbor Naval Base, which is closed to commercial traffic, is six nautical miles west of Honolulu Harbor. Two off-shore mooring berths that serve the oil refineries in Campbell Industrial Park are located off Barbers Point. The populated Hawaiian Islands waters and channels are the thoroughfare for cargo, military, fishing, and recreational vessels. In 2011 there were 14,073 registered vessels in Hawaiʻi (State of Hawaiʻi Data Book 2011). Inter-island vessels (2,390) transported 3,220,416 cargo tonnage and overseas vessels (884) carried 6,487,553 cargo tonnage into the Port of Honolulu in 2011 (State of Hawaiʻi Data Book 2011). Passenger cruise ship traffic included 420,649 arrivals and 778,405 departures at Honolulu Harbor in 2011 (State of Hawaiʻi Data Book 2011).

Under the proposed action, vessels would have to adhere to regulations regarding approach and discharge while transiting Special Sanctuary Management Areas. Additionally, vessels may be subject to regulations from other state and federal agencies. However commercial boat harbors are not included within the sanctuary boundaries so the proposed action will not impact marine traffic and transportation within harbors.

9.10.5. Marine Managed Areas

Marine managed areas are key tools for maintaining sustainable reef ecosystems by limiting or promoting particular resource uses and activities and raising awareness on issues of reef

sustainability (Kendall and Poti 2011). Both state and federal agencies are involved in managing marine areas. Many of the different marine managed areas were created through independent processes with different objectives and management authorities.

That National Park Service manages four distinct marine areas as a park of the National Park system in in Hawai‘i: Kalaupapa National Historical Park on Moloka‘i, World War II Valor in the Pacific National Monument on O‘ahu, and Kaloko-Honokohau National Historical Park and the Pu`ukoholā Heiau National Historic Site on Hawai‘i Island. Pu`ukoholā Heiau National Historic Site is the only National Park with marine boundaries that overlay sanctuary boundaries.

There are fourteen types of marine management areas managed by the State of Hawai‘i in the populated Hawaiian Islands. These zones each have unique rules established by statute or rulemaking. They are classified as Marine Life Conservation Districts, Fisheries Management Areas, Marine Laboratory Refuges, Public Fishing Areas, a Wildlife Sanctuary, an Island Reserve, an Herbivore Management Area, Community Based Subsistence Fisheries, a Limu Management Area, Stewardship Areas, Coral Priority Sites, Natural Area Reserves, Designated Ocean Recreation Management Areas, Undesignated Ocean Recreation Management Areas, and the State Register of Historic Places.

Table 43 describes the size and locations of all existing marine managed areas throughout the population Hawaiian Islands. This table was compiled from a number of sources including the State of Hawaii Department of Land and Natural Resources (DLNR), State of Hawaii Division of Aquatic Resources (DAR), State of Hawaii Division of Forestry and Wildlife (DOFAW), State of Hawaii Division of Boating and Ocean Recreation (DOBOR), and the State Historic Preservation Division (SHPD).

The proposed action provides an added beneficial effect to marine resources and have a negligible effect on uses. This results in a less than significant incremental beneficial effect, but no cumulative effects. Overall, the existing marine managed areas could have a beneficial impact on the marine resources of Hawaii. Some marine managed areas are designed to protect marine resources and improve water quality. Marine managed areas with boundaries closer to the shoreline likely have more impact on local communities and fishing practices.

Typically, the further a marine managed area extends into the ocean, the more likely it will have an impact on ocean users. Additionally, marine managed areas that extend into deeper waters will more likely affect certain types of fishing activities, general vessel traffic, and potentially tourist and recreational activities. Several marine managed areas listed in Table 43 have fishing restrictions such as gear restrictions, no take zones, or anchoring restrictions. These restrictions may reduce fishing opportunities while providing an overall beneficial effect on water quality and marine species. Marine managed areas affecting vessel traffic, docking, and controlling access would reduce the likelihood of water quality degradation from spills or vessel discharges contributing to a beneficial cumulative impact.

Marine Managed Area (Island)	Date	Project Sponsor	Description	Approximate Size
National Parks				
Kalaupapa National Historical Park (Molokaʻi)	1980	NPS	Located midway along the north coast of the island of Molokaʻi, was the location from 1866-1969 of the isolated Hansen's disease (leprosy) community, and the purpose of the park is for preserving and interpreting its site and values.	165,760 acres
Kaloko-Honokohau National Historical Park (Hawaii)	1978	NPS	Located on the western coast of the island of Hawaii near the town of Kailua-Kona, site of an ancient Hawaiian settlement and provides a center for the preservation, interpretation, and perpetuation of traditional native Hawaiian activities and culture. Park includes the Kaloko Fishpond, Puuoina Heiau, and numerous wetlands.	1,160 acres
Puukohola Heiau National Historic Site (Hawaii) *	1972	NPS	Located on the northwestern coast of the island of Hawaii, contains a historically significant temple associated with Kamehameha the Great and the property of John Young who fought for Kamehameha the Great during the period of his ascendancy to power.	86 acres
World War II Valor in the Pacific National Monument (Oʻahu)	2008	NPS	Located at Pearl Harbor on Oʻahu, the park preserves and interprets the site, as well as honors all of the civilians, soldiers, and other sailors who were killed on December 7, 1941 during the attack on Pearl Harbor	10.5 acres
Marine Life Conservation Districts				
Haunama Bay (Oʻahu) *	1967	DLNR	Located on the southeastern coast of Oʻahu, Hanauma Bay was formed by two of the many craters that created Koko Head. The bay's outer part is the result of one crater, and the inner part is what remains of the second. The craters' seaward rims were eventually eroded by wave action.	101 acres
Pupukea (Oʻahu) *	1983	DLNR	Pūpūkea-Waimea MLCD is important as a center for marine recreation, conservation, and fishery replenishment. It is located offshore of both beach parks, and includes two major swimming areas, Shark's Cove and Three Tables.	
Waikiki (Oʻahu) *	1988	DLNR	The Waikiki MLCD is located at the Diamond Head end of Waikiki Beach and extends from the groin at the end of Kapahulu Avenue to the west wall of the Natatorium, from the highwater mark seaward a distance of 500 yards or to the edge of the fringing reef, whichever is greater.	76 acres
Kealakekua Bay (Hawaii)	1969	DLNR	Located on the western coast of Hawai'i near the village of Captain Cook, Kealakekua Bay's	315 acres

Marine Managed Area (Island)	Date	Project Sponsor	Description	Approximate Size
			waters are nearly pristine, and its diversity of marine life is spectacular. A sheer cliff borders the northern coastline, and on its face numerous lava tube opening are visible, some of which are ancient Hawaiian burial caves.	
Lapakahi (Hawaii) *	1979	DLNR	Located on the northwestern coast of Hawai'i, Lapahaki is divided into two subzones: Subzone A included Koai'e Cove, and Subzone B includes the waters 500 feet outside of Subzone A and extending southward along the shoreline adjacent to the park, from the high water mark to a distance of 500 feet offshore.	146 acres
Old Kona Airport (Hawaii)	1992	DLNR	Old Kona Airport is located on the western coast of Hawai'i just west of Kailua-Kona town, and includes the waters offshore of the Old Kona Airport State Park and adjacent private properties.	217 acres
Waialea Bay (Hawaii) *	1985	DLNR	Located in the southern portion of Kawaihae Bay, on the western coast of Hawai'i, Waialea Bay is a popular site for snorkel and SCUBA activities because of its diversity of marine life.	35 acres
Waiopae Tidepools (Hawaii)	2003	DLNR	Located on the Southeastern coast, the Waiopae Tidepools are easily accessible and home to an abundance of coral and fish life.	N/A
Honolua-Mokuleia Bay (Maui) *	1978	DLNR	Honolua Bay is located on the northwester coast of Maui, about 10 miles north of Lahaina; Mokuleia Bay is adjacent to Honolua to the southwest.	45 acres
Manele-Hulopoe (Lānaʻi) *	1976	DLNR	Manele and Hulopoe are adjacent bays on the southern coast of Lānaʻi, separated by a volcanic cone.	309 acres
Molokini Shoal (Maui) *	1977	DLNR	Molokini is a crescent shaped islet located 3 miles off Maui's southwestern coast. It is the southern rim of an extinct volcanic crater; the shallow inner cove is the crater's submerged floor.	77 acres
Fisheries Management Areas				
Kahului Harbor (Maui)	1984	DLNR	Kahului Harbor is the primary port on the northern coast of Maui. The Fisheries Management Area is bounded seaward by a line between the seaward edges of the breakwaters	9 acres
Kaunakakai Harbor (Molokaʻi) *	1990	DLNR	Kaunakakai Harbor is located on the southern coast of the island of Molokaʻi. Portions of the commercial harbor designated "Area 1A" and "Area 1B" are separated by a line extending from the Channel Range Lights, and portions of the small craft harbor are designated "Area 2".	35 acres

Manele Harbor (Lānaʻi) *	1984	DLNR	Manele Harbor is a small boat harbor on the southern coast of Lānaʻi. Area 1 refers to the shoreline portion of the entrance channel and basin, bounded seaward by a line connecting the seaward tip of the three groins along the shoreline. Area 2 refers to the breakwater portion of the entrance channel.	4 acres
Waikiki-Diamond Head (Oʻahu) *	1978	DLNR	The Waikiki-Diamond Head Shoreline Fisheries Management Area extends from the Ewa wall of the Waikiki War Memorial Natatorium to the Diamond Head Lighthouse, from the highwater mark out to a minimum seaward distance of 500 yards, or to the seaward edge of the fringing reef if one occurs beyond 500 yards.	236 acres
AlaWai Canal (Oʻahu)	1923?	DLNR	Ala Wai Canal is located immediately north of Waikiki, and includes the Manoa-Palolo drainage canal at the mouth of Manoa and Palolo Streams. Kapalama Canal is located at the mouth of Kapalama Stream, north of Sand Island.	> 1 acre
Heeia Reef (Oʻahu)	1961	DLNR	Heʻeia Kea Wharf is located at Heʻeia Kea Boat Harbor on Kaneʻohe Bay, Oʻahu.	> 1 acre
Waialua Bay (Oʻahu) *	1974	DLNR	That portion of Waialua Bay at Haleiwa bounded by lines drawn 100 yards seaward of and parallel to the Haleiwa Harbor Breakwater and 100 yards seaward of and parallel to the Haleiwa Beach Groin, and inland by a line ten yards downstream of and parallel to the Anahulu Bridge.	38 acres
Honolulu Harbor (Oʻahu)	1911	DLNR	Honolulu Harbor is the primary port on the southern coast of Oʻahu.	373 acres
Pokai Bay(Oʻahu)	1974	DLNR	That portion of Pokai Bay including the Pokai Boat Harbor and the Waianae Small Boat Harbor, the seaward boundary a straight line from Kaneilio Point to Lahilahi Point, and the northwestern boundary a straight line extending southwest from the point immediately seaward of Waianae High School.	212 acres
Hilo Harbor (Hawaii)	1970	DLNR	“Hilo Harbor” refers to that portion of the bay in Hilo bounded seaward by the breakwater, and a line from the tip of the breakwater southwestward to Alealea Point. “Wailoa River” is that part of Wailoa River bounded by a line drawn across the mouth of the river and the footbridge at the mouth of Waiakea Pond, and includes Waiolama Canal upstream to the highest wash of the tidal water. “Wailuku River” is that part of Wailuku River between the Mamalahoa Highway bridge and Wainaku Avenue bridge.	1501 acres

Kawaihae (Hawaii) *	1989	DLNR	Kawaihae Harbor is located at Kawaihae, South Kohala, on the northwest coast of the island of Hawaii. Restrictions apply to the south small boat basin.	2 acres
Puako Bay & Reef (Hawaii) *	1985	DLNR	The Puako Bay and Puako Reef Fisheries Management Area includes that portion of the reef from the shoreline at the westernmost edge of the boat ramp, along a line drawn parallel with the ramp seaward to the edge of the fringing reef north of Puako Point, then southwesterly following the fringing reef a minimum seaward distance of 250 yards or to the edge of the fringing reef if one occurs beyond 250 yards, to a line due west of the small cove at the southern end of Puako Beach Road.	337 acres
Kailua Bay (Hawaii)	1984	DLNR	The Kailua Bay Fisheries Management Area includes that portion of Kailua Bay enclosed by a straight line drawn from Kukaili-moku Point to the seawall of the Royal Kona Resort. The area is split into two subsections, Zone A and Zone B with varying permitted activities.	10 acres
Keauhou Bay (Hawaii)	1992	DLNR	The Keauhou Bay Fisheries Management Area is that portion of the bay bounded by a straight line drawn from Haiku'ua Point to Kaukala'ela'e Point.	6 acres
Kiholo Bay (Hawaii) *	1997	DLNR	The Kiholo Bay Fisheries Management Area includes that part of Kiholo Bay enclosed by a straight line drawn from Nawaikulua Point to Hou Point as shown, including the lagoon known as Waina-nali`i Pond, but not Luahinewai Pond.	655 acres
Kona Coast (Hawaii)	1991	DLNR	Kona Coast refers to the following four Fisheries Management Area Zones on the southwestern portion of Hawaii, each bounded by two lines extending seaward at right angles from shore and marked by signs on shore: (a) the "Wawaloli Zone", from south of Wawaloli Beach to south of Wawahi-waa Point; (b) the "Papawai Bay Zone", from Keahuolu Point to the northwestern end of the runway of the Old Kona Airport; (c) the "Kailua Bay Zone", from Kukailimoku Point near the Kailua lighthouse, to the former swimming pool at the Kona Inn Shopping Village; and (d) the "Red Hill Zone", from Puu Ohau ("Red Hill") to Onouli. The seaward boundary is at a depth of 100 fathoms (600 ft).	1738 acres
South Kona (Hawaii)	1998	DLNR	The waters off the coast of South Kona between the Ki`ilae-Keokea boundary and the Kapua-Kaulanamauna boundary. It is prohibited to fish for or take opelu with fish or animal bait, except with hook and line.	

West Hawaii (Hawaii) *	1999	DLNR	The West Hawaii Regional Fishery Management Area (FRA) extends along the west coast of the Island of Hawaii from Ka Lae, Ka'u (South Point) to 'Upolu Point, North Kohala, and from the highwater mark on shore seaward to the limit of the State's management authority. It includes Fish Replenishment Areas and Netting Restricted Areas along the coast.	39,456 acres
Hanamaulu Bay (Kaua'i)	1978	DLNR	The regulated region of the Hanamaulu Bay Fisheries Management Area is that portion of the bay, from the highwater mark seaward, bounded by a straight line from the tip of the breakwater westward to a point on the shoreline.	90 acres
Nawiliwili Harbor (Kaua'i)	2002	DLNR	The regulated region of the Nawiliwili Harbor Fisheries Management Area is that portion of the harbor, from the highwater mark seaward, bounded by a straight line from the southernmost tip of the western pier northeast to the corner formed where pier 1 meets the eastern pier.	33 acres
Port Allen (Kaua'i)	2002	DLNR	The regulated region of the Port Allen Fisheries Management Area is that portion of the Port Allen waters, from the highwater mark seaward, bounded by a straight line from the tip of the main breakwater northward to the bend in the breakwater of the small boat harbor.	24 acres
Kapaa &Waikaea Canals (Kaua'i)	1923	DLNR	Kapaa and Waikaea Canals are located in the city of Kapaa on the east coast of Kaua'i. Fishing is restricted to certain permitted activities.	
Waimea Recreational Pier (Kaua'i)	1978	DLNR	Waimea Recreational Pier is a public fishing pier located in Waimea Bay on the southern coast of Kaua'i. The Waimea Recreational Pier is a facility of the Division of State Parks.	3 acres
Marine Laboratory Refuge				
Coconut Island (O'ahu)	1953	DLNR	The Hawaii Marine Laboratory Refuge consists of the reefs and bay waters surrounding Coconut (Moku-o-loe) Island located in Kaneohe Bay, from the highwater mark on the island seaward to twenty-five feet beyond the outer edges of the reefs.	73 acres
Public Fishing Areas				
Wahiawa (O'ahu)	1981	DLNR	The Wahiawa Public Fishing Area includes a portion of the privately-owned Wahiawa Reservoir (Lake Wilson) in the central portion of O'ahu. The Wahiawa State Freshwater Park is located along the South Fork of the Reservoir and includes a boat launching ramp and vehicle-trailer parking areas.	

Waikaea (Hawaii) (brackish)	1981	DLNR	The Waiakea Public Fishing Area includes that portion of the Waiakea fish pond in the Wailoa River State Park in Hilo, south of the footbridge over Wailoa River, including the flood control channel and Mahohuli fish pond. A boat launching ramp is located within the park.	
Kokee (Kaua'i)	1981	DLNR	The Kokee Public Fishing Area includes certain streams, reservoirs and ditches in the Kokee State Park on Kaua'i.	
Wailua (Kaua'i)	2007	DLNR	The Wailua Reservoir Public Fishing Area is located off Kuamo'o Road approximately five miles mauka of Kuhio Hwy, above the city of Wailua on Kaua'i.	
Wildlife Sanctuary				
Paiko Lagoon (O'ahu) *	1981	DLNR-DOFAW	The Paiko Lagoon Wildlife Sanctuary includes all of the State owned land areas adjacent to Paiko Lagoon, and water areas within Paiko Lagoon.	26 acres
Island Reserve				
Kahoolawe Island (Kahoolawe)	1993	DLNR	Kaho'olawe Island Reserve includes the island of Kaho'olawe and surrounding waters seaward to a distance of two nautical miles.	49,876 acres
Herbivore Management Area				
Kahekili (Maui) *	2009	DLNR	Kahekili Herbivore Fisheries Management Area is located off north Ka'anapali. The northern boundary is a straight line extending 1292 yards west from Honokowai Beach Park, the southern boundary is a straight line extending 335 yards west from Hanaka'o'o Beach, and the seaward boundary is a straight line connecting the seaward endpoints of the northern and southern boundaries.	452 acres
Community Based Subsistence Fisheries				
Haena (Kaua'i) *	2006	DLNR	The Ha'ena communit-based subsistence fishing area is located on the north shore of Kaua'i off Ha'ena district from Na Pali State Park to Wainiha extending to 1 mile off the shoreline.	
Milolii (Hawaii)	2005	DLNR		
Limu Management Area				
Ewa (O'ahu)	2006	DLNR	The Ewa Limu Management Area is located in the waters off Ewa Beach on the south shore of O'ahu, and extends from the western edge of the gunnery range to Mu'umu'u Street, from the shoreline 150 feet seaward.	
Coral Priority Sites				
West Maui (Maui) *	2010	DAR	The West Maui coral priority site extends from Honolua to south of Ka'anapali.	
South Kohala (Hawaii) *	2010	DAR	Located on the Kohala coast, on the northwest coast of Hawaii Island, the coral priority site extends from North of Kawaihae to just south of 'Anaeho'omalu.	

Natural Area Reserve				
`Ahihi-Kina`u (Maui-coastal) *	1973	DOFAW	Hot, dry, and sparsely vegetated, the reserve is unique in that its boundaries contain the most recent ‘a’a lava flow on Maui, here on the dry south flank of Haleakala. It also included a marine component: the surrounded reef systems shelter a complex assemblage of organisms, most of the endemic to the Hawaiian archipelago.	776 acres (marine area)
Kanaio (Maui)	1991	DOFAW	This reserve is located in rough lava terrain on the southeast slope of Haleakala. The reserve protects a remnant of the native dry land forest that once covered the leeward slope of Haleakala.	
Hanawi (Maui)	1986	DOFAW	This reserve is located on the wet slopes on the north flank of Haleakala. It contains a rare subalpine grassland as well as montane and lowland semi-wet and wet grasslands and forests.	
West Maui (Maui) *	1986	DOFAW	The reserve includes a diverse set of ecosystems, and contains extremely important watershed sites which contain the headwaters of perennial streams. It is made up of four noncontiguous sections: Honokowai, Kahakuloa, Panaewa, and Lihau.	
Nakula (Maui)	2011	DOFAW	This reserve is located on the south slope of Haleakala and is a potential reintroduction site for endangered birds.	
Hono O Na Pali (Kaua‘i-coastal)	1983	DOFAW	Located on the western side of Kaua‘i, this reserve contains two adjacent mountain valley systems that terminate in sea cliffs. Sea cliffs, coastal, stream, wet forest, wet shrub land, montane bogs, and grassland communities are represented.	
Kuia (Kaua‘i)	1981	DOFAW	Located on the western side of Kaua‘i, this reserve is characterized by gradual to moderate slopes cut by intermittent streams. There are two rare ecosystems, a koa-‘ohi’a mixed montane mesic forest and a Kaua‘i diverse lowland mesic forest. Kuia also contains lowland dry shrub lands and montane wet forests.	
Pu`u O `Umi (Hawaii-coastal)	1987	DOFAW	This reserve covers the west upper slopes and summits of the Kohala Mountains down to the dry coastal sea cliffs.	
Laupahoehoe (Hawaii)	1983	DOFAW	Found on the northern slopes of Mauna Kea, in the cloud belt, this reserve is characterized by gentle and moderate slopes cut by young intermittent streams.	
Pu`uMaka`ala (Hawaii)	1981 and 2010	DOFAW	This reserve protects montane wet ‘ohi’a and koa forests. The forest provides important habitat for some of Hawai’i’s rarest birds, as well as several rare plants.	

Kipahoehoe (Hawaii-coastal)	1983	DOFAW	This reserve is located on the narrow section of land running down the southwest slopes of Mauna Loa. The reserve protects many different ecosystems.	
Manuka (Hawaii-coastal)	1983	DOFAW	This is the largest reserve in the State's system, extending from sea level to 5,000 feet elevation. As such, it features a broad range of habitats.	
Mauna Kea Ice Age (Hawaii)	1981	DOFAW	Located in the upper, southern flank of Mauna Kea, this reserve contains a rare alpine Aeolian desert and the only alpine lake in Hawai'i. Rare native invertebrates and evidence of Pleistocene glaciation can be found here.	
Kahauale`a (Hawaii)	1987 and 2010	DOFAW	This reserve can be found on the gentle slopes of Kilauea, a site of much recent volcanic activity.	
Waiakea 1942 Lava Flow (Hawaii)	1974	DOFAW	This reserve provides an example of a recent lava flow being colonized by 'ohi'a. It is located on the sloping northeast flank of Mauna Kea.	
Pu'uMaka'ala Ext CDUAs (Hawaii)	1981	DOFAW	Ka'ala is the highest point on the island of O'ahu (4,020 ft.) and is found in the northern section of the Waianae Mountain Range. The reserve contains some of the rarest plants in Hawai'i.	
Mount Ka`ala (O'ahu)	1985	DOFAW	This reserve encompasses an isolated, cloud-shrouded mountain plateau with slopes extending down to sea cliffs. The reserve is one of the few areas left undisturbed by feral ungulates. It contains wet and dry ecosystems and coastal dry grasslands, including lowland and montane wet and mesic forests.	
Oloku`i (Moloka'i-coastal)	1985	DOFAW	This reserve is located in the mountains of northern Moloka'i. It is an important part of the Moloka'i watershed and contains forest bird habitat	
Pu`uAli`i (Moloka'i-coastal)	1981	DOFAW	The reserve is located in the northwestern part of the island and protects rare Hawaiian plants, animals, and ecosystems of the lowland mesic zone.	
Pahole (O'ahu)	1983	DOFAW	The dry, windswept coastal dunes of Ka'ena are found at the most western point of O'ahu. Situated at the base of the Waianae Mountains, the reserve protects coastal dry shrub lands and rare coastal plants. It is also a nesting area for the Laysan albatross and is regularly visited by Hawaiian monk seals. Humpback whales and several species of seabirds often can be spotted offshore from this reserve.	
Ka`ena Point (O'ahu-coastal)	1973	DOFAW	The reserve is unique in that its boundaries contain the most recent 'a'a lava flow on Maui, here on the dry south flank of Haleakala. It also included a marine component: the surrounded reef systems shelter a complex assemblage of organisms, most of the endemic to Hawi'i.	

Designated Ocean Recreation Management Areas				
Kanaohe Bay Waters (O'ahu)	1994	DOBOR	Located on the windward coast of O'ahu, this area allows SCUBA diving, snorkeling and other activities and regulates commercial activities.	19,777 acres
Haleiwa Restricted Zones (O'ahu) *	1994	DOBOR	Located on the north shore of O'ahu, this area allows swimming, bathing, surfing and body surfing and regulates the use of thrill crafts.	157 ares
Waimea Bay Restricted Area (O'ahu) *	1994	DOBOR	Located on the north shore of O'ahu, this area allows swimming, bathing and surfing, among other activities.	21 acres
Sharks Cove, Three Tables Point & Waimea Ocean Waters (O'ahu) *	1994	DOBOR	Located on the north shore of O'ahu, this area restricts vessel speed.	26 acres
Sunset Beach Restricted Area (O'ahu) *	1994	DOBOR	Located on the north shore of O'ahu, this area allows surfing, kayaking and windsurfing, among other activities.	315 acres
Kawela Bay Restricted Area (O'ahu) *	1994	DOBOR	Located on the north shore of O'ahu west of Kahuku Point, this area restricts vessel speed.	46 acres
Kualoa Ocean Water Restricted Zones (O'ahu)	1994	DOBOR	Located on the windward coast of O'ahu, this area allows windsurfing and scuba diving, among other activities, and regulates commercial thrill crafts and sailing.	28 acres
Kailua Ocean Waters Restricted Zones (O'ahu)	1994	DOBOR	Located on the windward coast of O'ahu, this area allows windsurfing other manually propelled vessels, among other activities.	10 acres
Waimanalo Ocean Waters Restricted Zones (O'ahu)	1994	DOBOR	Located on the windward coast of O'ahu, this area allows swimming and bathing, among other activities.	4 acres
Makapu'u Ocean Waters Restricted Zones (O'ahu) *	1994	DOBOR	Located on the southern end of the windward coast of O'ahu, this area allows for swimming and bathing, among other activities, and regulates vessel speed.	67 acres

Kaneohe Commercial High Speed Boating Zone (O‘ahu)	1994	DOBOR	Located on the windward coast of O‘ahu, this area regulates commercial high speed boating activities.	7,331 acres
Hanauma Bay Restricted Zone (O‘ahu) *	1994	DOBOR	Located on the south shore of O‘ahu, this area allows snorkeling and swimming, among other activities.	83 acres
Maunalua Bay Restricted Waters (O‘ahu) *	1994	DOBOR	Located on the south shore of O‘ahu, this area regulates commercial operations.	2,344 acres
Waialae-Kahala Restricted Areas (O‘ahu) *	1994	DOBOR	Located on the south shore of O‘ahu, this area allows swimming, bathing and water sports equipment.	11 acres
Diamond Head Restricted Area (O‘ahu) *	1994	DOBOR	Located on the south shore of O‘ahu, this area allows sufing, sailboarding and other manually prepared vessels, among other activities.	130 acres
Waikiki Ocean Waters Restricted Zones (O‘ahu)	1994	DOBOR	Located on the south shore of O‘ahu, this area regulates commercial thrill craft and vessel speed.	1,231 acres
South Shore Parasail Area (O‘ahu)	1994	DOBOR	Located on the south shore of O‘ahu, this area allows parasailing.	14,014 acres
Kahakaaulana Islet (Harris Island) Commercial Zone (O‘ahu)	1994	DOBOR	Located on the south shore of O‘ahu, this area allows windsurfing and diving, among other activities, and regulates commercial thrill craft and sailing.	42 acres
Reef Runway Zone (O‘ahu)	1994	DOBOR	Located on the south shore of O‘ahu, this area regulates recreational thrill crafts.	737 acres
Koko Head & Makapu‘u Commercial High Speed Boating Zone (O‘ahu) *	1994	DOBOR	Located on the south shore of O‘ahu, this area regulates commercial high speed boats.	9,936 acres
Napili Bay Restricted Area (Maui) *	1994	DOBOR	Located on the west coast of Maui, this area allows swimming and surfing, among other activities.	23 acres

Lahaina-Kaanapali Offshore Restricted (Maui) *	1994	DOBOR	Located on the west coast of Maui, this area allows parasailing, among other activities.	13,748 acres
Kaanapali Commercial Thrill Craft Areas (Maui) *	1994	DOBOR	Located on the west coast of Maui, this area regulates commercial thrill craft.	9 acres
Olowalu Beach Resetricted Area (Maui) *	1994	DOBOR	Located on the west coast of Maui, this area allows swimming, snorkeling, SCUBA diving and shore fishing, among other activities.	50 acres
Kaanapali Commercial Water Sledding Zone (Maui) *	1994	DOBOR	Located on the west coast of Maui, this area regulates commercial water sledding.	217 acres
Maui Humpback Whale Protected Waters (Maui) *	1994	DOBOR	Located on the west coast of Maui, this area regulates vessels operations.	70,989 acres
Hookipa Restricted Zone (Maui)	1994	DOBOR	Located on the north coast of Maui, this area allows swimming, surfing and fishing, among other activities.	28 acres
Baldwin Park-Paia Bay Restricted Area (Maui)	1994	DOBOR	Located on the north shore of Maui, this area allows swimming, diving and fishing, among other activities.	159 acres
Papaula Point Restricted Zone (Maui)	1994	DOBOR	Located on the north coast of Maui, this area allows fishing and diving, among other activities.	39 acres
Kanaha Beach Park Restricted Zones (Maui)	1994	DOBOR	Located on the north coast of Maui, this area allows swimming, among other activities.	18 acres
Hilo Bay Recreational Thrill Craft Zone (Hawaii)	1994	DOBOR	Located on the east coast of Hawaii Island, this area regulates recreational thrill crafts.	118 acres
Waiakea Access Corridor (Hawaii)	1994	DOBOR	Located on the east coast of Hawaii Island, this area allows beach access for recreational thrill craft and waterski activities, among other activities.	1 acre

Puhi Bay-Leleiwi Point Restricted Zones (Hawaii)	1994	DOBOR	Located on the east coast of Hawaii Island, this area allows swimming, diving, surfing, and canoeing, among other activities.	55 acres
Hoanuanu Bay Swimming Zone (Hawaii)	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	6 acres
Kahaluu Bay Swimming Zone (Hawaii)	1994	DOBOR		
Kalaepaakai Point Commercial Thrill Craft Zone (Hawaii)	1994	DOBOR		
Oneo Bay Swimming Zone (Hawaii)	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	20 acres
Kailua Bay Boating Zone (Hawaii)	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows parasailing and recreational thrill crafts, among other activities.	215 acres
Kailua Pier Restricted Zones (Hawaii)	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and boating, among other activities.	8 acres
Honokohau Swimming Zone (Hawaii)	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	1 acre
Kua Bay Swimming Zone (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming, among other activities.	6 acres
Kahuwai Bay Restricted Zone (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area regulates vessel speed.	7 acres
Kiholo Bay Speed Zone (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area regulates vessel speed.	2 acres

Anaehoomalu Bay Restricted Zones (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	14 acres
Makaiwa Bay Swimming Zone (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	5 acres
Hapuna Bay Swimming Zone (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	3 acres
Kaunaoa Bay Restricted Zones (Hawaii) *	1994	DOBOR	Located on the west coast of Hawaii Island, this area allows swimming and diving, among other activities.	15 acres
Hanalei River Mouth & Anini Beach Launching Ramp (Kauaʻi) *	1994	DOBOR	Located on the north shore of Kauaʻi, this area allows swimming and bathing, among other activities.	3 acres
Anini Beach Ocean Waters (Kauaʻi) *	1994	DOBOR	Located on the north shore of Kauaʻi, this area regulates commercial sailboard instruction.	223 acres
Hanalei Bay Ocean Waters (Kauaʻi) *	1994	DOBOR	This area is located on the north shore of Kauaʻi.	770 acres
Haena Ocean Waters (Kauaʻi) *	1994	DOBOR	Located on the north shore of Kauaʻi, this area allows swimming, snorkeling and other recreational activities.	127 acres
Na Pali Coast Ocean Waters (Kauaʻi)	1994	DOBOR	Located on the north shore of Kauaʻi, this area regulates vessel operations.	36,810 acres
Hanamaulu Bay Restricted Zones (Kauaʻi)	1994	DOBOR	Located on the south shore of Kauaʻi, this area allows swimming and bathing, among other activities, and regulates vessel speed.	112 acres
Nawiliwili Bay Restricted Zones (Kauaʻi)	1994	DOBOR	Located on the south shore of Kauaʻi, this area allows general ocean recreation.	45 acres
Nukumoi Restricted Area (Kauaʻi)	1994	DOBOR	Located on the south shore of Kauaʻi, this area allows swimming and bathing, among other activities.	3 acres

Koloa Landing Restricted Area (Kauaʻi)	1994	DOBOR	Located on the south shore of Kauaʻi, this area allows swimming and diving, among other activities.	4 acres
Salt Pont Park Restricted Area (Kauaʻi)	1994	DOBOR	Located on the south shore of Kauaʻi, this area allows swimming and bathing	3 acres
Wailua River Restricted Area (Kauaʻi)	1994	DOBOR		
State and National Register of Historic Places				
Hanalei Pier (Kauaʻi) *		SHPD		
Na Pali Coast Archeological district (Kauaʻi)	1984 (State and National)	SHPD	The Na Pali Coast Archeological District is located on the northwest coast of Kauaʻi.	
Kaniakapupu (Oʻahu)	1986 (State and National)	SHPD	Kaniakapupu is located on the south shore of Oʻahu in Nuuanu.	
Kapapa Island Complex (Oʻahu)	1981 (State) 1972 (National)	SHPD	Kapapa Island is located off the windward coast of Oʻahu in Kaneohe Bay.	
Kukuipilau Heiau (Oʻahu)	1984 (State and National)	SHPD	Kukuipilau Heiau is located on the windward coast of Oʻahu in Kailua.	
Nuuanu Petroglyph Complex (Oʻahu)	1979 (State) 1973 (National)	SHPD	Nuuanu Petroglyph Complex is located on the south shore of Oʻahu	
Waianae District (Oʻahu)	1974 (National)	SHPD	Waiʻanae District is located on the west side of Oʻahu.	
Kealakekua Bay Historical District (Hawaii)	1973(National)	SHPD	Located south of Kona on Hawaii Island, Kealakekua Bay Historical District is the site of both a MLCD and a State Historical Park.	
Cook Landing Site (Kauaʻi)		SHPD		
Kukui Heiau (Kauaʻi)	1984 (State and National)	SHPD	The Na Pali Coast Archeological District is located on the northwest coast of Kauaʻi.	

Table 43. Marine managed areas in the populated Hawaiian Islands.
NOTE: Zones that fall inside the current Sanctuary boundaries are marked with an *

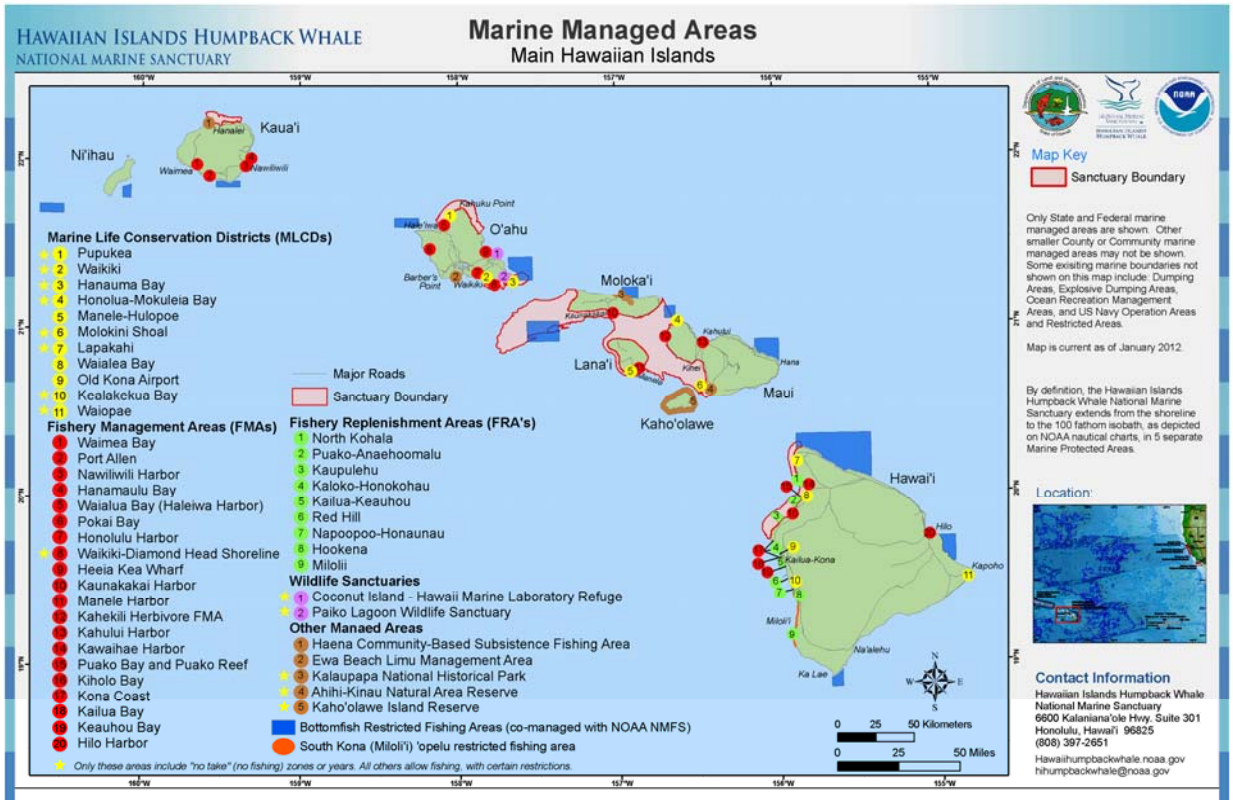


Figure 28. Map of Marine Managed Areas in the Populated Hawaiian Islands.

10. Action Plans

This section is the 2014 draft management plan for the Hawaiian Islands Humpback Whale National Marine Sanctuary (sanctuary), now proposed as the *Hawaiian Islands National Marine Sanctuary - Nā Kai ʻEwalu*. A sanctuary management plan is a site-specific planning and management tool that describes the sanctuary's goals, objectives, guides current and future activities, outlines staffing and budget needs, and sets priorities and performance measures for resource protection, research and education programs.

The National Marine Sanctuaries Act (NMSA) requires the Office of National Marine Sanctuaries (ONMS) to periodically review and evaluate the progress in implementing the management plan and goals for each sanctuary, with special focus on the effectiveness of site-specific techniques and strategies. ONMS must revise management plans and regulations as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. § 1434(e)) to ensure that sanctuary sites continue to best conserve, protect, and enhance their nationally significant natural and cultural resources.

The process to develop the draft management plan for the sanctuary began in the summer of 2010 when the sanctuary conducted a 90-day public scoping process. During that time, sanctuary management conducted a series of public meetings to solicit feedback from the public about how to proceed with management. In total, several hundred community members, stakeholders, and agency representatives attended ten public scoping meetings held on the island of Hawaiʻi, Oʻahu, Kauaʻi, Maui, Molokaʻi, and Lānaʻi. Individuals and stakeholders who were unable to attend the public scoping meetings also had the opportunity to submit written comments online or in writing. A total of 12,375 public submissions were submitted to the sanctuary by agencies, organizations, elected officials and community members.

The sanctuary advisory council (council) reviewed the public scoping comments and established working groups to further examine the following nine priority issues:

- Ecosystem Protections: Species and Habitats
- Humpback Whale Protections
- Climate Change
- Water Quality
- Maritime Heritage
- Native Hawaiian Culture
- Ocean Literacy
- Offshore Development
- Enforcement

The working groups were made up of council members, community and user group representatives, and technical experts. Working group meetings were open to the public and facilitated public participation by gathering input from relevant constituent groups. Each working group produced a technical report, which included recommendations for management actions that the sanctuary should take to address those issues. Together the reports contained over 150

recommendations for sanctuary management activities. Sanctuary staff considered all of the proposed activities when developing the draft management plan.

The working group reports overwhelmingly illustrated the need for a more holistic approach to managing marine resources within the sanctuary. The *Ecosystem Protections Recommendation Report* specifically recommended ecosystem-based management as an appropriate approach to effectively managing the marine environment. The *Native Hawaiian Culture Recommendation Report* provided guidance about integrating traditional Native Hawaiian management perspectives into an ecosystem-based management framework. The activities described in the draft management plan reflect these recommendations and describe how the sanctuary proposes to transition from single-species management of humpback whales to an ecosystem-based management approach.

The management activities in the management plan are organized into fifteen action plans. These 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 are sorted into five thematic areas that serve to organize and structure the plans as seen in Table 44 below.

Action Plan	Desired Outcome
Implementing Ecosystem Protection	
Understanding and Managing Specis and Habitats	A resilient marine ecosystem able to respond to and recover from change, that supports sustainable ecosystem functions and services, and healthy populations of biologically, culturally, and economically significant marine species and habitats.
Resilience to a Changing Climate	A climate resilient sanctuary maintained through innovative management approaches and supported by an informed public.
Water Quality Protection	Water quality standards and levels of compliance that support healthy ecosystems, habitats and marine resources, as well as human activities that are compatible with resource protection.
Perpetuating Cultural Heritage	
Living and Evolving Cultural Traditions	Hoʻohawaiʻi: foster the uniqueness of Hawaiʻi through the understanding of both historical and contemporary local knowledge about coastal and marine environments, and the perpetuation of customary environmental practices and principles within the sanctuary.
Maritime Heritage	NOAA, the State of Hawaiʻi, partner agencies, businesses and local communities are engaged in the identification and appreciation of maritime heritage resources in Hawaiʻi to effectively preserve these resources for the benefit of current and future generations.
Transitioning Towards Sustainability	
Community Partnerships	Informed and empowered human communities that are actively engaged in dialogues and initiatives to facilitate an integrated management approach that perpetuates a healthy co-existence between humans and the marine environment.
Ocean Literacy	An ocean literate public with increased awareness, knowledge and appreciation of natural and cultural marine resources in order to promote and enhance ocean stewardship.
Sustainable Use	Vibrant coastal communities and economies that promote the sustainable use of the marine environment.

Sanctuary Focus Areas	
Niʻihau	The preservation of healthy coastal and marine ecosystems, and the rich cultural history of Niʻihau.
Pīlaʻa	A replicable model for applying both traditional Hawaiian and western science-based management practices to restore the health of nearshore ecosystems in the Pīlaʻa ahupuaʻa.
Southern Maui Nui	Establish a research area in the waters of the Māʻalaea area of Maui island to better understand and improve water quality.
Maunalua Bay	The community's kuleana of Maunalua Bay characterized by healthy coral reef and sea grass habitats, abundant coral reef marine life and high water quality standards is achieved by caring for this place with future generations in mind.
Ensuring Management Effectiveness	
Operational Foundation	Effective and well-planned operations, human resources and adequate physical infrastructure to support effective management of the sanctuary.
Compliance and Enforcement	A high level of compliance achieved through the adherence to sanctuary regulations, guidelines, and best practices resulting in increased protection of the marine environment within the sanctuary.
Emergency Preparedness and Damage Assessment	Increased protection of sanctuary resources from both natural hazards and human-caused incidents or injuries, through coordinated emergency response and damage assessment.
Assessing Progress	A performance evaluation framework to continually gauge the sanctuary's progress in meeting its management goals and objectives.

Table 44. Action plans grouped in thematic areas with desired outcomes.

Each action plan consists of a desired outcome and overview, objectives and activities, outputs and outcomes, and performance measures.

The desired outcome describes the future state of the sanctuary that you would expect to see if the action plan were fully implemented.

The overview provides background information, particularly related to the need for action and the potential role of sanctuary programs in addressing the topic, and describes how the sanctuary staff will address the issues through management.

The management actions proposed in each action plan are organized by objectives and subdivided into activities.

The objective describes the process to achieve the desired outcome by focusing on a particular aspect or process of sanctuary programs or operation.

An activity is the direct and specific action taken by sanctuary managers and staff to address a particular issue and achieve the related objective and desired outcome. Activities are organized into categories (blue banners), which are found consistently throughout all of the action plans. A proposed output and an outcome are described for each of the activities.

The output is the direct result from the successful implementation of the related activity. The outcome describes an improvement or change that can be attributed to the successful implementation of an activity or group of activities.

The performance measures can be used by ONMS and sanctuary staff to evaluate successful implementation of each action plan. These measures will demonstrate baseline (current) and future progress toward achieving the desired outcomes stated for each action plan. As part of the effort to improve overall resource management effectiveness, ongoing and routine performance evaluation has become a national priority for ONMS and the sanctuary. Both location-specific and national programmatic efforts are under way to better gauge the sanctuary's ability to meet its stated objectives and to address the issues identified in this management plan.

The total estimated cost to fully implement the sanctuary manage plan over the next five years is $24,103,225. Table 45 below displays the estimated costs of implementing each action plan, by year. The purpose of the budget estimates (approximate calculations) is to help ONMS establish management priorities and allocate annual funds for the sanctuary. The availability of funds can vary from year to year and as a result of possible changes in federal funding levels, certain sanctuary programs may require modification or deferred implementation to reflect budgetary reality. The estimate costs were developed to encompass core operations and programmatic costs. Core operations costs include staff and contract labor, training, transportation and travel, utilities, property rental, printing, supplies, equipment, vessels, and vessel maintenance.

Action Plan	Estimated Annual Cost					Action Plan 5-Year Total
	Year 1	Year 2	Year 3	Year 4	Year 5	
Implementing Ecosystem Protection						
Understanding and Managing Species and Habitats	$994,774	$1,394,006	$1,273,120	$970,816	$1,218,655	$5,851,371
Resilience to a Changing Climate	$50,882	$117,660	$66,708	$61,152	$53,245	$349,647
Water Quality Protection	$242,874	$230,232	$190,314	$178,192	$189,290	$1,030,902
Perpetuating Cultural Heritage						
Living and Evolving Cultural Traditions	$91,155	$360,824	$213,313	$192,416	$141,565	$999,273
Maritime Heritage	$216,918	$425,908	$171,566	170,464	$169,970	$1,154,826
Transitioning Towards Sustainability						
Community Partnerships	$186,327	$235,850	$233,369	$204,624	$188,255	$1,048,425
Ocean Literacy	$351,848	$288,956	$229,990	$236,320	$242,650	$1,349,764
Sustainable Use	$132,613	$194,404	$88,944	$82,432	$171,580	$669,973
Sanctuary Focus Areas						
Niʻihau	$235,973	$276,236	$165,462	$111,216	$120,750	$909,637
Pīlaʻa	$155,942	$197,584	$101,261	$70,336	$95,105	$620,228
Maunalua Bay	$158,620	$106,053	$114,995	$94,864	$102,005	$576,537
Southern Maui Nui	$59,431	$98,527	$46,979	$42,896	$44,045	$291,878
Ensuring Management Effectiveness						
Operational Foundation (fixed costs)	$396,889	$422,126	$455,678	$472,479	$497,683	$2,244,855
Operational Foundation (variable costs)	$832,858	$1,004,244	$904,264	$977,984	$994,060	$4,713,410
Compliance and Enforcement	$306,528	$382,024	$317,190	$304,640	$322,460	$1,632,842
Emergency Preparedness and Damage Assessment	$81,782	$102,184	$65,400	$67,200	$67,160	$383,726
Assessing Progress	$70,040	$48,548	$59,841	$26,432	$71,070	$275,931
Total Estimated 5-Year Cost						**$24,103,225**

Table 45. Total estimated costs to fully implement action plans by year.

Table 46 illustrates the hierarchy among components of the action plans, the sanctuary goals and guiding principles, and the ONMS mission (see Section 4 Purpose and Need).

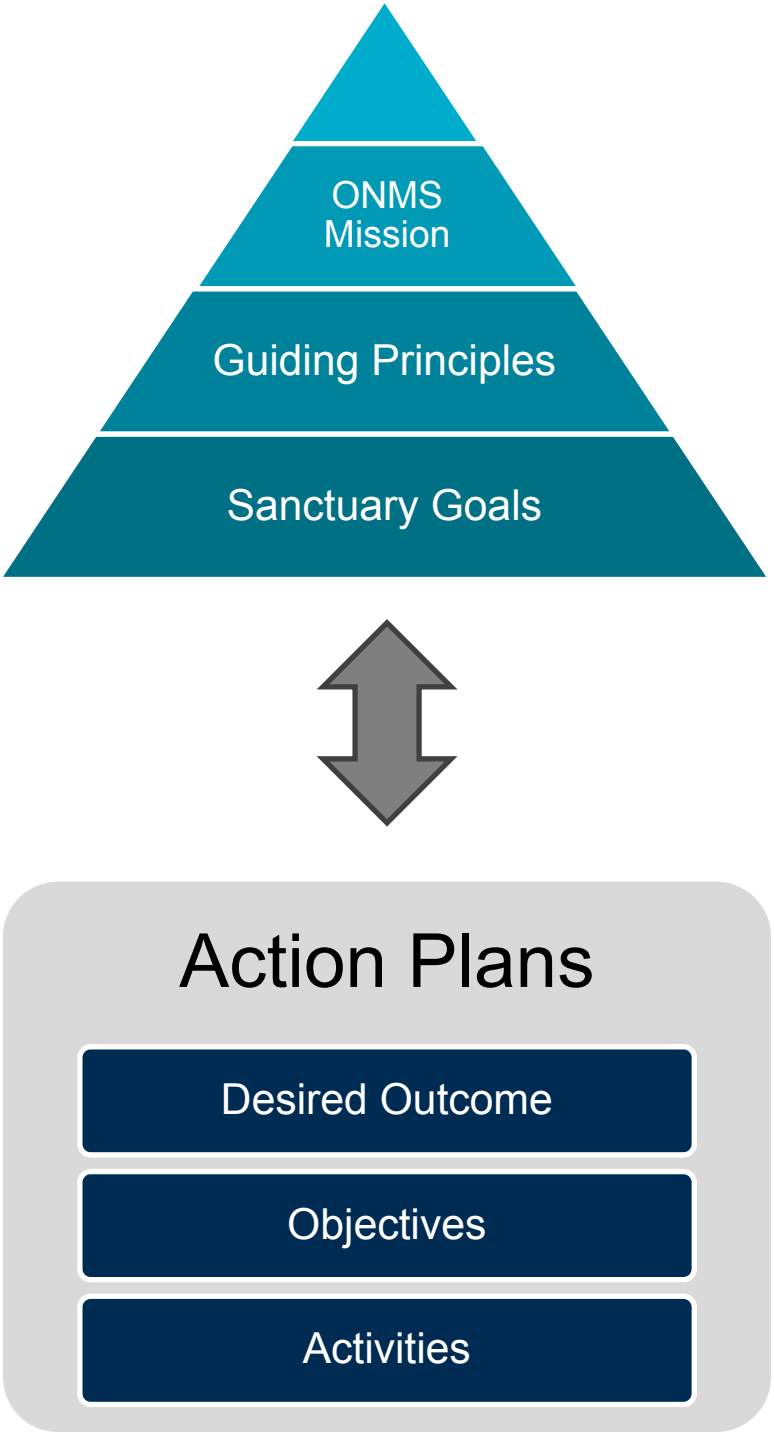
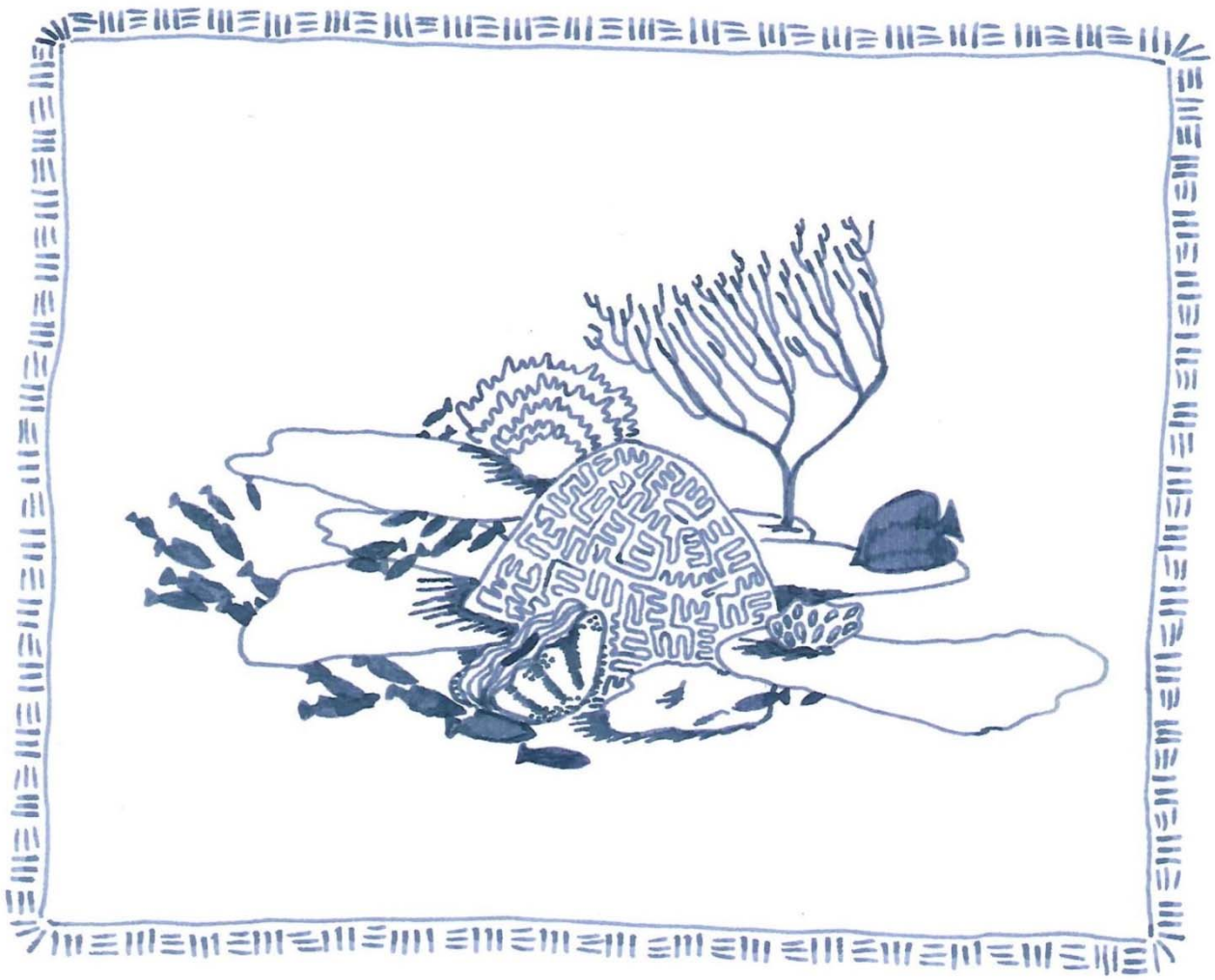


Table 46. Relationship between Action Plans and overall management framework.

10.1. Implementing Ecosystem Protection



The *Implementing Ecosystem Protection* thematic area describes how the sanctuary will adopt an ecosystem-based management approach to protect ecosystems within the sanctuary. Sanctuary waters include unique features and support significant ecosystems that are in need of additional protection. Shallow and mesophotic coral reefs, along with native algal and seagrass beds are home to a variety of species that comprise marine ecosystems that have some of the highest endemism rates in tropical waters worldwide. Unsustainable human use, impacts to water quality, and existing and expected impacts from climate change, threaten the resilience and health of these ecosystems. By implementing measures to plan for, mitigate and regulate impacts, the sanctuary, in partnership with co-managing agencies, communities and the broader public, can support the integrity and resilience of these special natural resources

Through formal comments from stakeholders and the sanctuary advisory council, the sanctuary co-managers received recommendations to adopt an ecosystem-based management approach. This approach is also consistent with guidance from the National Ocean Policy which directs resource management agencies to utilize ecosystem-based management with an adaptive management framework (National Ocean Policy, Executive Order 13547). Statutes such as the Endangered Species Act, Marine Mammal Protection Act and the Hawaiian Islands Humpback Whale National Marine Sanctuary Act have effectively afforded protections for individual species, however other species, habitats and ecosystems also deserve priority management attention because of their ecological, cultural, and economic importance to the Hawaiian Islands.

The three action plans in the *Implementing Ecosystem Protection* thematic area are: *Understanding and Managing Species and Habitats* (ER), *Resilience to a Changing Climate* (RC), and *Water Quality Protection* (WQ). These action plans outline the actions that the sanctuary will take to support a healthy and resilient marine ecosystem in Hawai‘i. The *Understanding and Managing Species and Habitats* action plan specifically seeks to support the maintenance of healthy ecosystem functions and services and provide support for marine species and habitats that are biologically, culturally, and economically significant. The *Resilience to a Changing Climate* action plan presents a suite of tools to assess and protect sanctuary resources and to support the needs of adjacent human communities that are particularly vulnerable to climate change impacts. The *Water Quality Protection* action plan focuses on actions that will improve water quality while still allowing for human use activities that are compatible with resource protection. Collectively, these three action plans address impacts and target the most important and broad-based components of a marine ecosystem for protection - habitats, species and water.

Implementing Ecosystem Protection

10.1.1. Understanding and Managing Species & Habitats

Kau i Kāpua ka poʻe polohuku ʻole.

Those without resources will land at Kāpua.

Without resources one gets nowhere.

Desired Outcome

A resilient marine ecosystem able to respond to and recover from change, that supports sustainable ecosystem functions and services, and healthy populations of biologically, culturally, and economically significant marine species and habitats.

Overview

An ecosystem-based management approach will protect and conserve ocean habitats and species as well as protect and promote sustainable human uses. Sanctuary management will draw on both traditional Native Hawaiian concepts of management and western ecological knowledge to create an integrated management framework. This holistic approach to resource management creates more flexibility when identifying management priorities. Adaptive management calls for continuously assessing management actions to allow for better informed and improved future resource management decisions.

Many marine habitats in the populated Hawaiian Islands have been impacted by human interactions, continue to be disturbed, and are in need of restoration. Other marine areas need to be maintained in a healthy and resilient condition. This transition to an ecosystem-based management approach will allow the sanctuary to promote responsible use of marine resources and reduce threats. This approach will also consider significant habitats, keystone and indicator species, and groups of species that serve important biological, cultural, and economic functions. The identification and proper management of threats and impacts to habitats and species is a key component to maintaining overall ecosystem health and human well-being.

The sanctuary will continue to focus on the conservation and protection of humpback whales as the signature species of the sanctuary and will also support the conservation of other protected species, by effectively partnering with the community and other managing agencies and broadening the scope of existing programs (e.g. applying large whale entanglement response to other species). This plan outlines an ecosystem-based management framework that includes continuously evaluating and assessing priority habitats and species that may need immediate attention in an adaptive management framework.

The sanctuary may use a suite of management tools, including education and outreach, community-based management plans, research and monitoring, ecosystem service valuation, and development of best management practices to improve management of habitats and species. In addition, the sanctuary can also play an important role as a coordinating body and participate in multi-agency initiatives to reduce stressors and address threats to the ecosystem such as marine debris and invasive species.

The *Understanding and Managing Species and Habitats Action Plan* outlines the activities the sanctuary will take to better understand and protect species and habitats within the sanctuary. Currently the sanctuary has one Research Specialist on staff and is looking to add a Research Coordinator position. Given the limited capacity of staff and wide scope of research questions within the sanctuary, staff would actively seek to collaborate with key research partners to gather information on the status of species and habitats within the sanctuary and prioritize significant ecosystems for management actions. A cornerstone of research activities would be to identify threats to marine species and habitats, including but not limited to invasive species, entanglement, and vessel collisions. With this research, the sanctuary would implement activities to address those threats. Within the expanded, ecosystem-wide scope of research and management, the sanctuary will continue to manage humpback whales, including ongoing humpback whale response efforts. Sanctuary staff will also seek to better understand, assess and evaluate ecosystem services to better inform natural and cultural resource management decision-making, environmental damage assessments, and education and outreach materials. The success of sanctuary management will also depend on compliance by an educated and informed public so the sanctuary will continue to engage in trainings and outreach activities to improve awareness, change attitudes and behavior and build a sense of stewardship.

Related 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 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.

Objective SH-1:

Assess, evaluate and develop management approaches to protect and enhance key habitats, and by doing so contribute to more resilient ecosystems within the sanctuary.

Activity		Output	Outcome
Gather Information			
SH-1.1.	Collaborate with key research partners and institutions to evaluate and prioritize key habitats, and understand the status and threats to those habits that are biologically, culturally, and economically significant priorities for the sanctuary to focus on for additional management actions.	Clearly articulated framework that identifies and evaluates priority habits within the sanctuary, using established and agreed upon metrics (criteria) for prioritizing habitats that require additional management protections.	Priority habitats identified and evaluated for addressing human use impacts and associated threats.
Place-Based Planning			
SH-1.2.	Partner with key research institutions to develop a research and monitoring plan to better understand the distribution, status and threats to key sanctuary habitats and species (shallow and mesophotic coral, algae etc).	Research and monitoring plan developed, including the identification of priority sites or habitats, to better understand and inform management approaches to addressing impacts on those resources.	Targeted research and monitoring programs developed to better understand and address impacts to key habitats in the sanctuary, and contribute to building resilient ecosystems in the sanctuary.
SH-1.3.	Develop and implement regional sanctuary program research implementation plan to achieve research goals of regional sanctuary sites.	Regional research implementation plan developed and implemented.	
Reciprocal Learning			
SH-1.4.	Facilitate information sharing and learning among experts, including traditional cultural practitioners and western scientists, communities, agencies and organizations engaged in habitat science and management.	Forums and meetings for the development, improved understanding and integration of traditional Hawaiian and science-based management models, approaches and information requirements.	Increase integration of traditional and western science in management decisions.

Activity		Output	Outcome
Enhance Management			
SH-1.5.	Define appropriate types and levels of engagement for the sanctuary to support the implementation of other NOAA and State of Hawai‘i resource management priorities and initiatives (e.g., ORMP) for protecting key habitats in and adjacent to sanctuary waters.	Defined partnership roles for engagement by the sanctuary in supporting other NOAA and State of Hawaii planning and resource protection priorities.	Collaborative and coordinated management of key habitats that meet the objectives of different management initiatives.

Objective SH-2:

Develop collaborative resource management partnerships to better identify, understand and address threats to priority habitats within the sanctuary.

Activity		Output	Outcome
Gather Information			
SH-2.1.	Identify, prioritize and conduct a compatibility analysis on human use activities in the sanctuary to better understand and prioritize those that may pose a threat to priority habitats within the sanctuary, and should be considered for additional management action.	Human use compatibility analysis, habitat threat assessment and evaluation report with recommendations for management actions to address threats to key habitats in the sanctuary.	Enhanced understanding of human use activities and their impacts on key habits to prioritize future management actions.
Enhance Management			
SH-2.2.	Coordinate with the State of Hawai'i to implement a day-use mooring buoy plan and buoy placement in strategic locations within the sanctuary to help minimize impacts from vessel anchoring to coral reef habitats and the seafloor.	Implementation of a day-use mooring buoy plan in targeted areas.	Reduced impacts on habitats within the sanctuary by addressing sources of impacts.
SH-2.3.	Partner with lead agencies and NGOs on addressing both the vectors and eradication of aquatic invasive species that are impacting key habitats in the sanctuary.	Prioritized set of actions developed and implemented to minimize the impacts of aquatic invasive species	
SH-2.4.	Evaluate and prioritize ways the sanctuary can further support efforts to reduce marine debris that is impacting key habitats in and adjacent to the sanctuary.	Prioritized set of actions developed to reduce marine debris (e.g. beach cleanups).	
SH-2.5.	Coordinate with federal and state agencies, as well as local, national and international organizations, by participating in a range of forums that build an improved understanding of how to effectively manage key habitats in the sanctuary by drawing on lessons learned, tested models and case studies.	Participation in working groups, task forces, workshops, and meetings to enhance information sharing and improving the understanding of how to manage key habitats such as coral reefs in the sanctuary.	Enhanced and expanded array of approaches to managing threats and ensuring resilience of key habitats in the sanctuary.

Activity	Output	Outcome
Enhance Collaboration		
SH-2.6. Assist, support and coordinate citizen science programs, including coral reef monitoring, that provide on-going data and fill data gaps necessary to inform management decision making and used to address impacts to key habitats in the sanctuary.	Enhanced capacity of citizen science programs (e.g., Eyes of the Reef, Makai Watch, and Team OCEAN), and improved access to a long term data and information that fills data gaps and is used to inform management decision making.	Increased engagement by public in identifying and reducing threats.

Objective SH-3:

Assess human use impacts and appropriate management approaches in order to protect priority marine species that required targeted protection and may serve as key indicators of ecosystem health of the sanctuary.

Activity		Output	Outcome
Gather Information			
SH-3.1.	Collaborate with key research institutions and agencies to identify, evaluate, and prioritize key marine species and functional groups (that interact with each other) within the sanctuary that are biologically, culturally, and economically significant and should be considered for additional management protection.	Clearly articulated framework that identifies, evaluates and prioritizes keystone and indicator species, as well as important functional groups of species, that tell the story of the health of priority ecosystems within the sanctuary.	Species and functional groups identified and evaluated as indicators of the health of the ecosystem in the sanctuary and require further protective measures.
Assess Resources			
SH-3.2.	Facilitate research and monitoring amongst already established and potential new partners to assess humpback whales including behavior, population dynamics, health, distribution, biogeography and other ecological parameters, throughout the range of the populated Hawaiian Islands.	Add to existing data and provide new data on humpback whales to better understand the status, health and behavior of this resource.	Increased understanding of humpback whales that contributes to more effective management approaches.
Enhance Collaboration			
SH-3.3.	Collaborate with researchers, agencies and institutional partners and community groups to evaluate and adapt citizen science and other volunteer programs to better contribute to the scientific understanding of humpback whales and other priority marine species.	Improved citizen science programs designed to better meet data needs and contribute to species management (e.g., Ocean Count).	Increased understanding of human interactions and threats to species, and improved management.
SH-3.4.	Collaborate with commercial and recreational user groups to analyze marine wildlife watching patterns in order to identify potential impacts to humpback whales, spinner dolphins, sea turtles, and monk seals from interactions with visitors and recreational user groups.	Increased understanding of marine wildlife watching patterns and human behaviors and interactions with marine species and the potential impacts on species of concern.	

Objective SH-4:

Identify and reduce threats and damage from commercial and recreational ocean users to priority marine species within the sanctuary.

Activity		Output	Outcome
Resource Protection			
SH-4.1.	Continue to lead, assess and document response efforts to disentangle whales and respond to vessel-whale interactions as part of the *Large Whale Response Program.*	Established, safe and timely whale response efforts led by the sanctuary.	Improved and expanded response to priority marine species in distress.
SH-4.2.	Provide expertise, resources and support for responding to the disentanglement and rescue of other priority marine species in distress including, but not limited to, monk seals, sea turtles and other cetaceans in and around the waters of Hawaii, nationally and internationally.	Response support and expertise made available and expanded to additional priority marine species.	
Gather Information			
SH-4.3.	Evaluate options for reducing vessel collisions and approach interactions by vessels (e.g., speed limits, vessel traffic lanes) with priority marine species.	Management framework to address threats to priority marine species from vessel activity.	Reduce harmful, and sometimes fatal, interactions between vessels and species.
Enhance Collaboration			
SH-4.4.	Partner with federal and state agencies to address bycatch and entanglement of protected species from fishing and other marine use gear by collaborating with ocean users to create best management practices, and evaluate and implement mitigation measures.	Increased collaboration to address bycatch and entanglement.	Reduced threats and mortality of marine species from bycatch and entanglement.
SH-4.5.	Collaborate with management agencies on issues relating to threat reduction and mitigation for priority marine species (e.g., marine turtles, monk seals, and spinner dolphins) from threats in addition to bycatch and entanglement.	Active involvement in decision-making processes across agencies (e.g., working groups, task forces, workshops, meetings) to address a range of threats to marine species.	Coordinated management resulting in threat reduction to priority marine species.

Activity		Output	Outcome
Enhance Collaboration			
SH-4.6.	Collaborate on and facilitate pilot projects to assess effects of and potential mitigation of close approach and human contact interactions for spinner dolphins in recognized resting areas (e.g., bays and harbors).	Pilot project established to monitor and better understand the success of protection efforts implemented in spinner dolphin resting areas.	Increased understanding of impacts of human-dolphin interactions.
Build Capacity			
SH-4.7.	Train existing and new responders in response techniques and protocols as part of the *Large Whale Response Program*, and other marine mammal and turtle response.	Large whale and priority marine species response training.	Improved and increased response efforts to reduce impacts on marine species.

Objective SH-5:

Understand and assess the role of ecosystem services and their value within the sanctuary to better inform policy, planning, management.

Activity		Output	Outcome
Gather Information			
SH-5.1.	Coordinate with universities and research institutions to develop a database of existing ecosystem valuation studies of the marine environment in Hawai‘i to better inform policy and planning within the sanctuary.	Database of valuation studies in Hawai‘i to better understand the relationship between the sanctuary's priority resources and the value that they have within an ecosystem-based context.	Understanding of the function(s) of the parts of the ecosystem that contribute to a healthy and productive ecosystem as a whole, which in term informs the prioritization and targeting of management efforts.
Assess Resources			
SH-5.2.	Estimate the value of ecosystem services within the sanctuary by using transferable information (extrapolations) from existing studies in a comparable location or context to better understand individual resources, the role they play and contribution they make to a functioning ecosystem in the sanctuary.	Benefit transfer studies for marine resources within the sanctuary to better understand the function(s) of individual marine resources within the context of the ecosystem(s) of the sanctuary.	Effective resource protection that considers the impacts from human use activities on the whole system not just targeted species or habitats.
SH-5.3.	Conduct quantitative assessments (economic valuation) and qualitative assessments (multidimensional evaluation methods) of ecosystem services provided by sanctuary resources to fill gaps in the transferable information studies.	Develop assessments that fill gaps in critical ecosystem service valuation in regards to priority resources within the sanctuary.	

Activity		Output	Outcome
Capacity Building			
SH-5.4.	Facilitate information exchanges between marine scientists, managers, social scientists, economists, Native Hawaiians, and other interested stakeholders to assist in fostering an understanding of the ecosystem valuation process.	An understanding of what can be achieved through the use of ecosystem valuation and how the results can be applied.	More effective natural and cultural resource protection that considers the impacts from human use activities on the whole system not just targeted species or habitats.
Planning and Organizing			
SH-5.5.	Assemble ecosystem service valuation information to develop a conceptual model of what ecosystem valuation looks like within the sanctuary and use that to inform decision making.	Conceptual model used to inform management decisions.	Making decisions and taking management actions based on an ecosystem-based model specific to the sanctuary.
SH-5.6.	Introduce concepts of valuation assessments, including indigenous sciences and traditional Native Hawaiian use and non-use valuation concepts, in education and outreach activities to demonstrate the importance of healthy and intact marine ecosystems in Hawai‘i.	Education and outreach materials, trainings and programs informed by Native Hawaiian perspectives and ecosystem valuation.	Increased awareness among the public, agency decision makers and resource managers about the value of indigenous science and the ecosystem services that marine environments provide.
SH-5.7.	Work with resource management agencies to include valuation assessments of ecosystem services to determine liability and cost of environmental damages (including cascading effects).	Environmental damage assessments that include ecosystem valuation.	Integration of ecosystem valuation into natural resource damage assessments in the sanctuary.

Objective SH-6:

Conduct and enhance education and outreach on marine habitats and species to improve the understanding and appreciation of the need for protecting sanctuary resources for now and future generations and directly contribute to the efforts of sanctuary management.

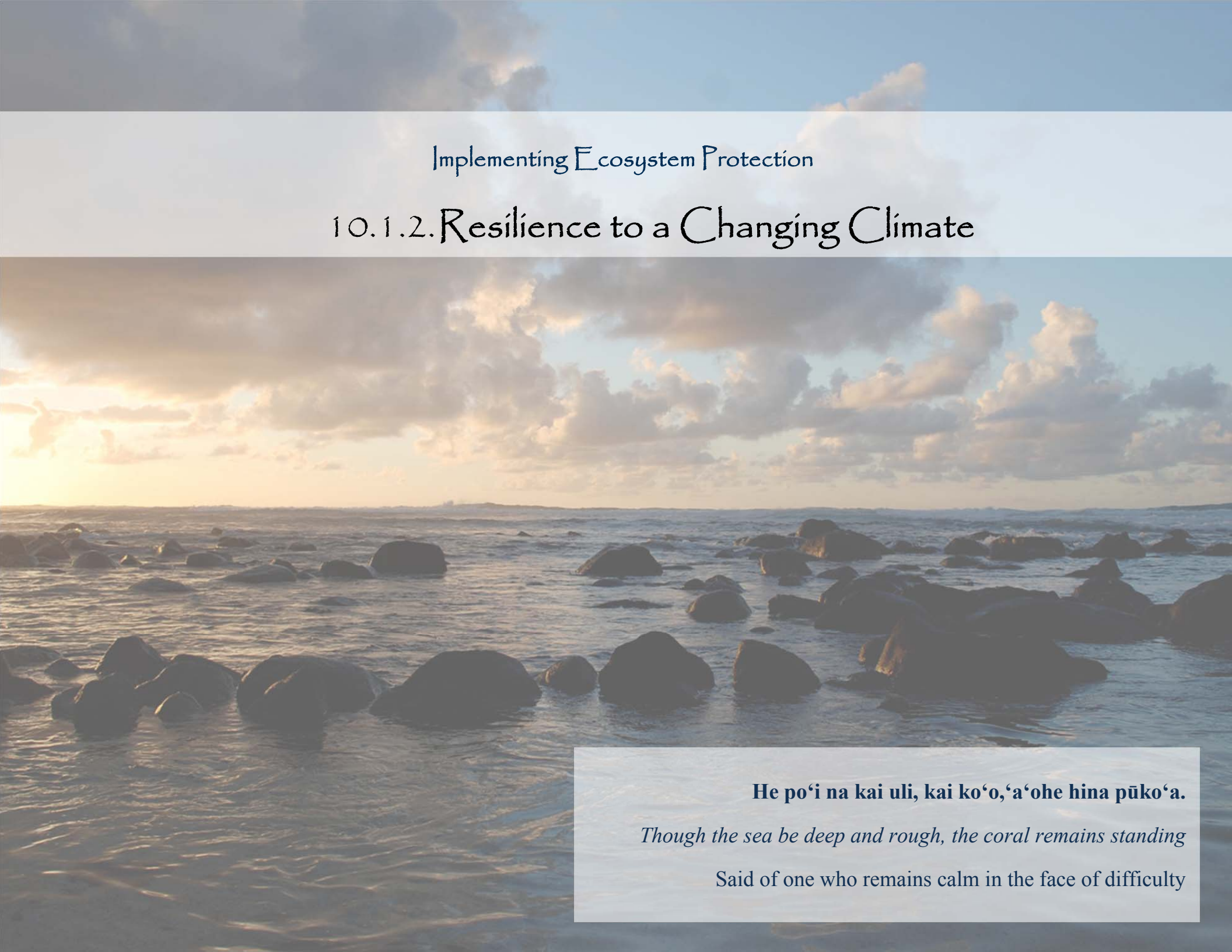
Activity		Output	Outcome
Improve Communication			
SH-6.1.	Develop education and outreach materials to effectively communicate information about the components that make up a healthy ecosystem within the sanctuary, and how an intact system contributes to the overall health of the marine environment, the ecosystem services it provides and the contribution it makes to the well being of humans.	Education and outreach materials on the significance of marine habitats and species to ecosystem health.	Increased public awareness of marine habitats and species resulting in opportunities for individuals to take responsibility for reducing threats to habitats and species.
SH-6.2.	Increase efforts to educate ocean users on how to report, record and document both vessel collisions with and strandings of marine species.	Dissemination of information on reporting collisions and strandings.	Improved reporting on marine species collisions and strandings.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Understanding and Managing Species and Habitats	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	SH-1.2. Partner with key research institutions to develop a research and monitoring plan to better understand the distribution, status and threats to mesophotic coral in the sanctuary.	Within 1 year, a research and monitoring plan has been developed that answers key management questions about the status of mesophotic coral in the sanctuary, and informs adaptive management responses to trends in the status (health) of the mesophotic coral over time.
		SH-2.1. Identify, prioritize and conduct a compatibility analysis on human use activities in the sanctuary to better understand and prioritize those that may pose a threat to priority habitats within the sanctuary, and should be considered for additional management action.	Within 2 years, a compatibility analysis has been completed on human use activities within the sanctuary that becomes the basis of and informs new management on priorities and approaches to address impacts from incompatible uses.
		SH-3.3. Collaborate with researchers, agencies and institutional partners to evaluate and adapt citizen science and other volunteer programs to better contribute to the scientific understanding of humpback whales and other priority marine species.	Within 2 years, the Sanctuary Ocean Count volunteer program data collection portfolio has been expanded from humpback whales to other priroity protected species.
		SH -4.3. Evaluate options for reducing vessel collisions and approach interactions by vessels (e.g., speed limits, vessel traffic lanes) with priority marine species.	Within 3 years, a management framework has been developed to effectively reduce vessel collisions and other harmful vessel interactions with priroity protected species.
		SH-5.5. Assemble ecosystem service valuation information to develop a conceptual model of what ecosystem valuation looks like within the sanctuary and use that to inform decision making.	Within 4 years, a conceptual model of ecosystem valuation of the sanctuary has been developed and is being used to inform and move management decisions towards a more ecosystem-based management approach.

Implementing Ecosystem Protection

10.1.2. Resilience to a Changing Climate



He poʻi na kai uli, kai koʻo,ʻaʻohe hina pūkoʻa.

Though the sea be deep and rough, the coral remains standing

Said of one who remains calm in the face of difficulty

Desired Outcome

A climate resilient sanctuary maintained through innovative management approaches and supported by an informed public.

Overview

Climate change refers to variability in the climate of the earth. While the process of climate change has occurred naturally for thousands of years, recent changes have been attributed to observed increases in human induced greenhouse gas concentrations. In Hawai‘i, the changing climate is predicted to increase sea level, change weather and precipitation patterns, and increase ocean temperature (Alber, 1998; Haw. Rev. Stat. §286). The associated greenhouse gases (e.g., CO_2) inducing climate change will also contribute to increased acidification of the ocean (Feely 2011).

Global and regional changes to the marine environment may have significant consequences for ecological and cultural resources within the sanctuary. Increased sea level and extreme weather events are already accelerating coastal erosion and sediment runoff, which in turn impact water quality. Changes in precipitation and saltwater intrusion induced by sea level rise, will adversely affect species and habitats that are sensitive to salinity shifts, especially in estuarine and freshwater habitats. Increased ocean temperature may cause reef building coral to bleach, become stressed and eventually die. Ocean acidification may slow or halt the calcification of several calciferous species including coral, coralline algae and mollusks and dissolve calcium carbonate structures on the reef. Declines in the abundance and health of calciferous plankton could negatively impact species throughout higher levels of the food chain (NOAA 2011). At the same time, coastal communities contending with rising seas may pursue mitigation approaches such as shoreline alterations (e.g., hardening shoreline surfaces) that will have additional ecological impacts.

A comprehensive effort to better understand the impacts of climate change to the ecosystems within the sanctuary, and effectively plan for adaptive management practices, is needed to manage sanctuary resources. This plan is consistent with and supports larger agency efforts towards NOAA’s Climate Goal (*Understand climate variability and change to enhance society’s ability to plan and respond*) as well as enhance compliance with Executive Order 13423 (*Strengthening Federal Environmental, Energy, and Transportation Management*) and Executive Order (*Preparing the United States for the Impacts of Climate Change*). This plan also supports Hawaii Revised Statues § 226-109 Climate Change Adaptation Priority Guidelines that encourages “collaboration and cooperation among county, state, and federal agencies, policy makers, businesses, and other community partners to plan for the impacts of climate change and avoid, minimize, or mitigate loss of life, land and property for future generations.” The plan also supports response strategies outlined in the 3rd U.S. National Climate Assessment released in 2014. The sanctuary will work with a range of partners to implement the activities in this action plan including the University of Hawaii Sea Grant program, the Pacific Islands Climate Change Cooperative, the Environmental Protection Agency, and other state and federal agencies.

The *Resilience to a Changing Climate Action Plan* describes the steps the sanctuary will take to identify potential climate threats to marine resources and dependent communities, as well as the actions the sanctuary will take to plan for and mitigate potential impacts. Sanctuary staff plan to engage with the well-coordinated network of climate change organizations and university departments currently evaluating and planning for climate threats to natural and cultural marine resources in Hawai‘i. The sanctuary will follow the climate change planning model developed by Office of National Marine Sanctuaries for "Climate Smart Sanctuaries." This process outlines steps a sanctuary should take to engage key stakeholders and technical experts, identify threats, and plan for change. To promote a wider understanding of and preparedness for climate impacts beyond sanctuary boundaries, sanctuary staff will work to integrate climate messaging into outreach materials and communication messages.

Related 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 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.

Objective RC-1:

Identify and better understand existing and potential climate impacts to marine resources, and dependent human communities, so that climate impacts can better be addressed through targeted sanctuary management actions.

Activity		Output	Outcome
Gather Information			
RC-1.1.	Collaborate with existing climate change monitoring programs to monitor physical and biological indicators of climate change within and adjacent to the sanctuary (e.g., salinity, pH, temperature, currents, and sea level rise).	Biological and physical climate indicators to inform possible management responses to climate impacts to marine resources.	Better informed management approach to understand primary climate threats, impacts, and response capacity of marine resources and human communities in and adjacent to the sanctuary.
RC-1.2.	Make use of climate models that illustrate biological and physical change in the marine environment over time.	Change models used to inform management decision making now and into the future.	
Assess Resources			
RC-1.3.	Characterize and map the adaptive capacity of species and habitats to climate change.	Assessment and specialization of the adaptive capacity of species and habitats to respond to change.	Improved ability to inform and prioritize management actions based on natural and cultural resource vulnerability.
RC-1.4.	Work with Native Hawaiian communities to identify natural and cultural resources that are vulnerable to climate change (e.g., fishponds, lo'i, limu).	Vulnerability assessment of natural and cultural resources.	
RC-1.5.	Complete a cumulative impact analysis to synthesize existing information on the main climate drivers and non-climate stressors, and how they collectively impact ecosystems, cultural resources, and coastal communities.	Cumulative impact analysis of climate and non-climate stressors.	Management that better responds to the interactions and impacts of climate and non-climate stressors.

Objective RC-2:

Tailor sanctuary management actions to build both resilient natural and human systems that have the capacity to respond, recover, or adapt to climate change impacts in the coastal and marine environment.

Activity	Output	Outcome
Build Capacity		
RC-2.1. Establish a sanctuary advisory council climate change working group to engage key stakeholders, technical experts, and advisory council members in climate change adaptation planning.	A stakeholder based climate change working group established to prioritize climate change management approaches to building resilient natural and human systems.	An improved understanding of human and natural systems and how they respond to climate stressors in order to better manage for change.
RC-2.2. Provide training for sanctuary staff and partners on how to build a management framework to better understand and increase resilience of priority marine ecosystems within the sanctuary to change.	Staff and partners trained in climate change adaptation to better understand the process to build the adaptive capacity of human and natural systems.	
Place-Based Planning		
RC-2.3. Develop a green operations plan that establishes operating standards for energy use, sustainable product use, waste disposal, water use and management at sanctuary offices and facilities.	Establish green infrastructure operating standards to be applied to sanctuary facilities.	Improved management of climate impacts created by sanctuary facilities.
Improve Communication		
RC-2.4. Conduct outreach to the general public about existing and potential climate impacts to marine resources and communities adjacent to the sanctuary as part of ocean literacy initiatives.	Information distributed to the public on potential climate impacts to marine resources and communities integrated into outreach materials.	An educated public aware of climate impacts and actions they can take to decrease their carbon footprint and enhance adaptive capacity.
RC-2.5. Incorporate climate issues and management responses into communications to provide relevant and timely information to stakeholders on climate change.	Climate messages that speak specifically to the general public and build awareness integrated into communications.	

Activity		Output	Outcome
Enhance Collaboration			
RC-2.6.	Establish a series of sentinel sites within the sanctuary that function as indicator sites and tell the story of the health of the sanctuary in relationship to climate change, and monitor specific biological resources and physical parameters.	Sentinel sites identified and profiled as indicators of climate change impacts.	The creation of an, collaborative coordinated, and integrated climate change approach across agencies to be more effective at addressing climate change impacts to marine resources and communities.
RC-2.7.	Engage with other agencies and institutions in the Pacific Islands region on climate change planning efforts to develop integrated management approaches to maximize resiliency of coastal and marine resources, and human communities.	Expanded role of the sanctuary to contribute to, support and participate in integrated local and regional climate change initiatives.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Resilience to a Changing Climate	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	RC-1.5. Complete a cumulative impact analysis to synthesize existing information on the main climate drivers and non-climate stressors, and how they collectively impact ecosystems, cultural resources, and coastal communities.	Within 2 years, a cumulative impact analysis has been completed to synthesize and better understand the collective impacts of both climate and non-climate stressors on key ecosystem indicators in the sanctuary, and provide a snapshot of areas of both resilience and vulnerability.
		RC-2.1. Establish a sanctuary advisory council climate change working group to engage key stakeholders, technical experts, and advisory council members in climate change adaptation planning.	Within 3 years, a sanctuary advisory council climate change working group has been established and developed a recommended framework for a climate change adaptation plan.

10.1.3. Water Quality Protection

Mōhala i ka wai ka maka o ka pua.

Unfolded by the water are the faces of the flowers.

Flowers thrive where there is water,

as thriving people are found where living conditions are good.

Desired Outcome

Water quality standards and levels of compliance that support healthy ecosystems, habitats and marine resources, as well as human activities that are compatible with resource protection.

Overview

Establishing and maintaining water quality standards is essential to the health of marine ecosystems, people and watersheds (mauka to makai). Coordinated management strategies and watershed-based management approaches are needed to reduce the threats and impacts to water quality in the marine environment. Marine pollution, such as discharge from vessels, can negatively impact water quality. Both point and non-point sources of land-based pollution, including wastewater and storm water runoff, can carry pollutants such as sediment, nutrients, pathogens, toxic substances (including heavy metals and pesticides), and suspended solids and debris from residential, urban, agricultural, and commercial sources. These inputs can negatively impact, the health and resilience of marine resources such as coral reefs, and the communities that depend on them. Mauka and coastal best management practices can be implemented to help prevent or reduce pollution from the upland areas within a watershed that enter and impact the ocean environment.

While the authority of the sanctuary is limited to the marine environment, there are opportunities to raise awareness and fill management gaps, while supporting and providing synergies within the existing management efforts and authorities of other county, state and federal agencies. For instance, collaborative partnerships with county, state and federal agencies can contribute to the enhancement of water quality monitoring programs. Sanctuary staff will work with partners to identify appropriate roles to support sound watershed and coastal planning, along with other efforts to help protect water quality in targeted areas within the sanctuary. Additionally, the sanctuary has a strong contingency of active volunteers who will enhance current efforts of state and federal agencies in supporting citizen-base water quality monitoring, while raising community awareness of water quality through education and outreach programs. This plan supports efforts of the Clean Water Act (CWA), Marine Debris Act Amendments of 2012 (H.R. 1171), Hawaii Marine Debris Action Plan, and State of Hawaii Department of Health priorities. The perpetuation of healthy water quality is fundamental to the perpetuation of a healthy kai (ocean).

The *Water Quality Protection Action Plan* proposes activities to protect and enhance water quality within the sanctuary. In order to achieve this goal, the sanctuary will strengthen existing partnerships and formalize new partnerships with key agencies including the Hawai‘i Department of Health. The sanctuary will engage technical experts in developing a formal monitoring plan to track changes in water quality over time and prioritize areas for management actions. In addition to calling on experts, the sanctuary will continue to build upon their successful volunteer initiatives by engaging the public in citizen science water quality monitoring. In considering native Hawaiian perspectives, the sanctuary will support community-based programs in and adjacent to the sanctuary, including fishpond restoration and operation, to address human impacts on watersheds. With the cultural and scientific knowledge on water quality gathered in these efforts, the sanctuary will collaborate to develop outreach materials.

Related 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 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.

Objective WQ-1:

Increase collaborative partnerships to address land-based and marine-based pollution in order to protect and enhance water quality that contributes to sustaining a healthy and fully functioning coral reef ecosystem in the sanctuary.

Activity	Output	Outcome
Enhance Collaboration		
WQ-1.1. Develop a memorandum of agreement (MOA) with State of Hawai'i Department of Health, and other agencies and partners as appropriate, to strengthen cooperation in watershed and water quality management that ultimately impacts coral reef ecosystems in the sanctuary.	Memorandum of agreement with State of Hawai'i Department of Health.	Increased coordination across various organizations resulting in more effective water quality management and higher levels of compliance with State of Hawaii water quality standards.
WQ-1.2. Work with the State of Hawai'i Department of Health to provide support for assessing compliance with *State Water Quality Standards* through cooperative programs (i.e., citizen scientist water quality monitoring programs).	Integrated approach to monitoring, evaluating compliance and protecting water quality.	
WQ-1.3. Coordinate with relevant county, state, and federal agencies to develop a response plan to assess, review and respond to sources of impacts in a timely manner whose origins maybe outside the sanctuary (i.e., point source pollution) that may impact water quality within the sanctuary.	Coordinated effort to develop a plan to response to incidence or catastrophic events that contribute to water quality in the sanctuary.	

Objective WQ-2:

Develop water quality research and monitoring partnerships to identify priority areas for improved water quality management by the sanctuary.

Activity	Output	Outcome
Gather Information		
WQ-2.1. Engage experts to identify existing water quality-related research and monitoring programs to identify water quality monitoring gaps, and priority areas and hot spots for developing new water quality monitoring programs in sanctuary waters.	Inventory of water quality programs, research gaps priority areas for new monitoring programs.	Increased understanding of research and management needs and gaps to improve water quality in the sanctuary.
WQ-2.2. Identify appropriate roles and priority needs and programs for citizen-science water quality monitoring in collaboration with agency partners and sanctuary volunteers.	Citizen-science monitoring program development to assess water quality providing useful data that are integrated into agency efforts.	Multi-stakeholder partnerships to fill research and monitoring gaps and raise awareness about water quality protection issues.
WQ-2.3. Collaborate with fishpond caretakers and cultural practitioners to support water quality monitoring in traditional Hawaiian fishponds within or adjacent to the sanctuary.	Water quality monitoring data collected within Hawaiian fishponds to understand change and trends over time.	Increased understanding and abilitiy to respond to impacts to water quality in fishponds.
WQ-2.4. Assess the feasibility of incorporating pump-out stations at other small boat harbors adjacent to the sanctuary as a way to reduce direct vessel discharge into sanctuary waters.	Interagency workshop to assess location and feasibility of pump-out station plans for harbors in the sanctuary.	Additional pump-out stations.

Objective WQ-3:

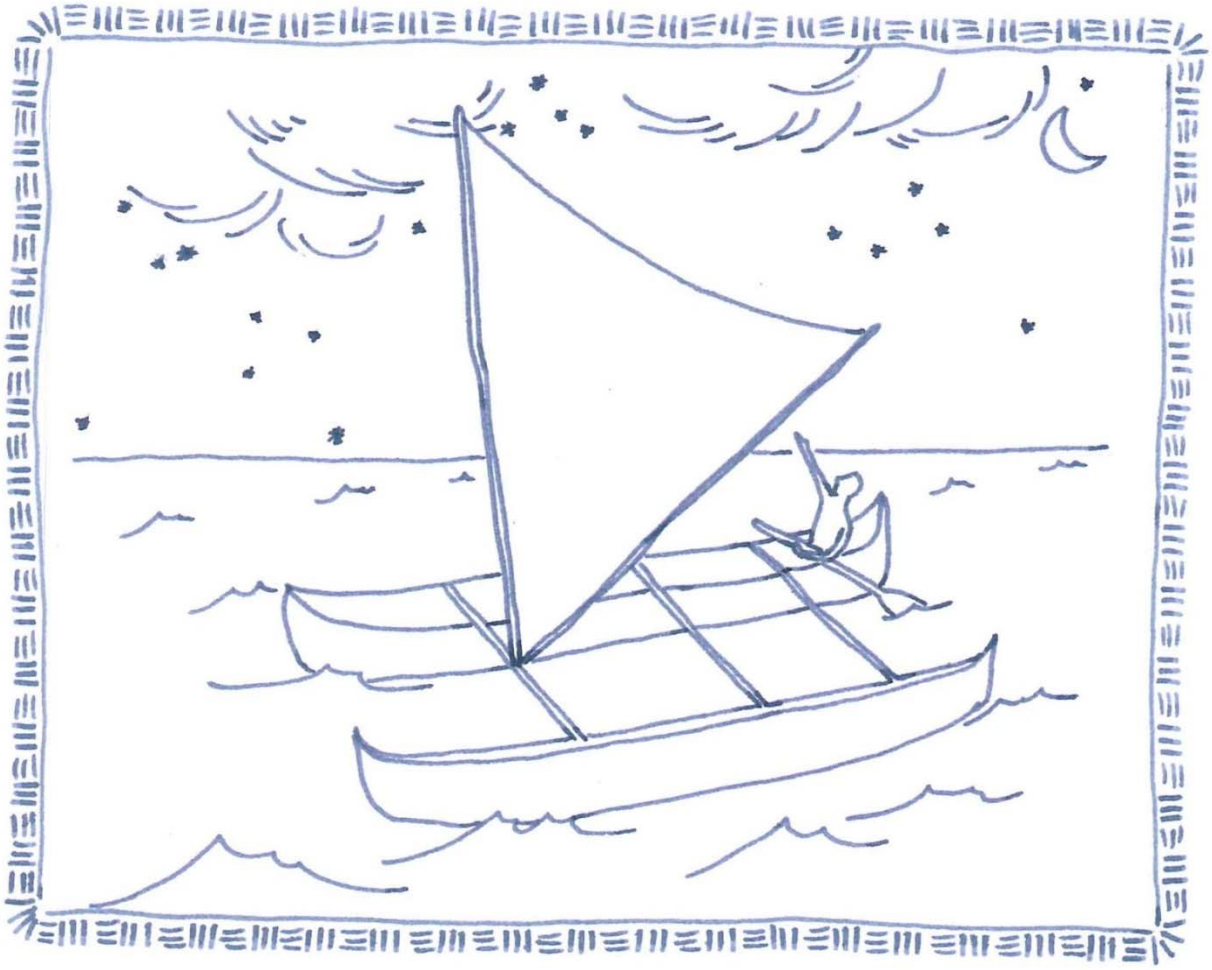
Expand sanctuary education and outreach to build better awareness about, and engagement in, collectively addressing and contributing to high water quality standards in the sanctuary.

Activity	Output	Outcome
Improve Communication		
WQ-3.1. Develop outreach materials and programs for residents, volunteers, visitors, and decision-makers on human use threats to water quality, and best practices to reduce those threats.	Water quality-related outreach materials and programs.	Influence behavior resulting in responsible water quality practices.
WQ-3.2. Educate recreational and commercial vessel operators about best management practices in regards to vessel discharge (e.g., bilge and human waste) as well as disposal of solid waste in order to improve water quality in the sanctuary.	Outreach materials and programs for commercial and recreational vessel operators on best management practices.	Vessel operators knowledgeable and implementing best management practices to reduce impacts on water quality.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Water Quality Protection	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	WQ-1.1. Develop a memorandum of agreement (MOA) with State of Hawai‘i Department of Health, and other agencies and partners as appropriate, to strengthen cooperation in watershed and water quality management that ultimately impacts coral reef ecosystems in the sanctuary.	Within 3 years, a formalized, cooperative partnership has been established with the State of Hawaii to address watershed and water quality impacts on coral reef ecosystems in the sanctuary.
		WQ-2.2. Identify appropriate roles and priority needs and programs for citizen-science water quality monitoring in collaboration with agency partners and sanctuary volunteers.	Within 5 years, one citizen-science program for monitoring water quality has been established on each island with a sanctuary presence.
		WQ-3.2. Educate recreational and commercial vessel operators about best management practices in regards to vessel discharge (e.g., bilge and human waste) as well as disposal of solid waste in order to improve water quality in the sanctuary.	Within 2 years, two trainings have been developed and conducted, one on O‘ahu and one on Maui, to educate vessel operators about sewage and solid waste disposal options.

10.2. Perpetuating Cultural Heritage



The *Perpetuating Cultural Heritage* thematic area describes the actions that the sanctuary will take to integrate cultural and maritime heritage resource conservation into sanctuary planning efforts. Cultural and maritime heritage preservation has special importance in Hawai‘i, where the indigenous host culture exists side-by-side with modernization, globalization and cultural diversification. Hawai‘i reflects strong local traditions, multicultural connections and major historic events, which have shaped the region. These resources, including cultural, historical and archaeological properties, and cultural landscapes all represent the physical legacy of this complex heritage.

The Hawai‘i State Constitution (Article XII, Section 7) protects indigenous and cultural gathering rights as a specific classification of rights in regards to coastal access and resources granted to Native Hawaiians. The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural, and religious purposes and possessed by ahupua‘a tenants who are descendants of Native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights.

The existing state and federal preservation laws intended to protect cultural, archaeological, and historical resources (the most relevant being Hawai`i Revised Statute Chapter 6-E, National Historic Preservation Act, Abandoned Shipwreck Act, and the Sunken Military Craft Act) are generally unfamiliar to the public and seldom followed. Multiple examples of illegal damage and removal of publicly-owned historic properties from sanctuary waters have been recorded. No federal or state agency has single-handedly addressed maritime cultural landscapes for the main Hawaiian Islands. The sanctuary aims to support existing state and federal preservation laws and seeks a better way of cooperating with communities to protect and preserve cultural and maritime heritage resources, as well as marine stewardship and preserving human ties to the marine environment.

The two action plans in the *Perpetuating Cultural Heritage* thematic area are Living and *Evolving Cultural Traditions* (CT) and *Maritime Heritage* (MH). These action plans describe how the sanctuary seeks to identify and effectively preserve cultural and historical traditions, knowledge, and resources. The *Living and Evolving Cultural Traditions* action plan promotes the understanding of both historical and contemporary local knowledge about marine environments, and perpetuates the use of customary environmental practices and principles within the sanctuary. Similarly, the *Maritime Heritage* action plan describes activities to identify maritime heritage resources in Hawai‘i in order to effectively preserve these resources for the benefit of current and future generations

Perpetuating Cultural Heritage

10.2.1. Living and Evolving Cultural Traditions

I ulu no ka lālā i ke kumu.

The branches grow because of the trunk.

Without our ancestors we would not be here.

Desired Outcome

Hoʻohawaiʻi: foster the uniqueness of Hawaiʻi through the understanding of both historical and contemporary local knowledge about coastal and marine environments, and the perpetuation of customary environmental practices and principles within the sanctuary.

Overview

The sanctuary's commitment to ecosystem-based management provides an opportunity to integrate customary knowledge and practices along with contemporary science to inform management. In order to effectively manage the biocultural resources in Hawaiʻi, it is important to include cultural perspectives and place-based information and solutions that uniquely reflect each island and community. This approach embodies Hawaiian values that connect people to the environment, and these values ultimately inform and direct appropriate environmental management practices.

The sanctuary staff has unique relationships with communities and Native Hawaiian practitioners. These relationships are developed through a strong network of partners including the community-based sanctuary advisory council, and extensive public participation in education and outreach venues on different islands. The sanctuary learns from organizations and entities that are committed to perpetuating cultural heritage, and aligns sanctuary programs appropriately. Ultimately, the sanctuary will strive to serve as a coordinated link between communities and agencies, and create opportunities to integrate place-based knowledge into all aspects of marine resource management.

To implement the activities in this action plan, the sanctuary will continue to coordinate and formalize partnerships with the Office of Hawaiian Affairs (OHA), the State Aha Moku committee, and the Native Hawaiian Civic Club Association. Sanctuary staff will develop programs and management approaches to ensure these traditional cultural practices are maintained for future generations. Cultural practices, both as resource management techniques and spiritual acts, are critical to cultural heritage because they keep history and moʻokūʻauhau (genealogy) alive. They describe the people of a place as well as the environments in which these practices were developed. Sanctuary management aims to honor these values and practices because they collectively provide a foundation for the cultural heritage of Hawaiʻi.

The *Living and Evolving Cultural Traditions Action Plan* proposes activities to understand and perpetuate both current and traditional Hawaiian cultural practices and knowledge in the management of the sanctuary. Sanctuary staff will improve their understanding of placed-based knowledge and cultural practices, especially as they relate to traditional resource management in the sanctuary. The sanctuary will incorporate these traditional perspectives into current sanctuary management to more effectively protect the specific biocultural resources around the Hawaiian Islands. To promote the incorporation of traditional Hawaiian perspectives in general ocean use and resource management, the sanctuary will facilitate the communication of Hawaiian cultural heritage, including surfing, voyaging and ahupua‘a management. To implement the activities in this action plan, the sanctuary will continue to coordinate and formalize partnerships with the Office of Hawaiian Affairs (OHA), the State Aha Moku committee, and the Native Hawaiian Civic Club Association.

Related Goals

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 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.

Objective CT-1:

Understand traditional Hawaiian cultural perspectives as related to the natural environment and customary environmental management practices.

Activity		Output	Outcome
Gather Information			
CT-1.1.	Partner with Hawaiian organizations and academia to build an understanding of different place-based cultural perspectives on and relationships with natural resources.	Network of knowledge sources that functions as a learning exchange.	Increased understanding of placed-based knowledge and traditional resource management approaches.
CT-1.2.	Collaborate with appropriate entities to assess existing information and ongoing research on biocultural resources and customary natural resource management practices in Hawai'i.	Literature review and database of existing studies.	
CT-1.3.	Partner to identify and support current community efforts to capture and apply place-based knowledge to more effectively manage resources within the sanctuary.	Documentation of place-based knowledge.	
Enhance Collaboration			
CT-1.4.	Conduct workshops to facilitate communication and direct interaction between diverse groups of academia and agencies, including traditional and Western science.	Workshops or other informal meeting opportunities.	Traditional and science-informed management approaches strengthened through collaborations with local experts.
CT-1.5.	Involve practitioners and researchers from diverse backgrounds to inform data collection and management solutions for sanctuary projects.	A database to access cultural knowledge.	
Build Capacity			
CT-1.6.	Continue language training for staff to ensure correct pronunciation and increased understanding of ʻōlelo Hawai'i (Hawaiian language).	ʻŌlelo Hawaiʻi training incorporated into staff development.	Sanctuary staff are more competent and able to perpetuate ʻōlelo Hawaiʻi pronunciation and understanding, as well as more familiar with cultural practices.
CT-1.7.	Provide opportunities for staff to participate in cultural experiences as related to coastal and marine environments of the sanctuary.	Staff participation in cultural experiences, including service projects.	

Objective CT-2:

Incorporate traditional Hawaiian management practices into sanctuary resource management approaches to ensure place-based management efforts are more relevant to each specific biocultural setting around the Hawaiian Islands.

Activity		Output	Outcome
Place-Based Planning			
CT-2.1.	Coordinate and facilitate the development of a replicable and adaptable model for place-based community planning efforts that make use of traditional Hawaiian management practices and science-based management.	Place-based community planning, including data products and spatial management plans.	Management initiatives to address impacts to the marine environment that are place-based and informed by culturally appropriate information and management approaches.
CT-2.2.	Develop partnerships with discrete communities and learning institutions to identify coastal and near shore areas to conduct, evaluate and document field-based learning experiences based on traditional ecological management approaches.	Selection of field-based learning sites (e.g., Pila'a) to partner with communities on learning institutions on different traditional management approaches to ecosystem management.	
CT-2.3.	Identify community facilitators who can effectively understand, communicate, and incorporate local knowledge, and engage in place-based planning processes.	Network of local facilitators who are engaged with sanctuary projects.	
Assess Resources			
CT-2.4.	Coordinate to inventory cultural places (e.g., Hawaiian fishponds) and traditional location names.	Spatial database of cultural places emphasizing practitioner involvement and capacity building.	Increased community involvement in the identification, assessment, and monitoring of cultural resources resulting in increased recognition and protection of these resources and places.
CT-2.5.	Coordinate with partners to assess and document coastal and freshwater springs, estuaries, sea caves, and anchialine ponds within or adjacent to the sanctuary, recognizing their significance as wahi pana and sites of cultural practice.	Spatial database for shoreline places.	
CT-2.6.	Coordinate with partners to create a spatial database of historical and biocultural shoreline resources within the sanctuary (e.g., opihi and limu) recognizing their significance for traditional gathering practices and supporting subsistence lifestyles.	Spatial database for shoreline biocultural resources.	

Activity		Output	Outcome
Place-Based Planning			
CT-2.7.	Coordinate with partners (i.e., voyaging organizations) to describe the navigational seascape across the populated Hawaiian Islands.	Spatial database initiated on traditional sea routes (e.g., navigational heiau, land-based guides).	Increased understanding of navigational seascapes as an important part of Native Hawaiian heritage.
CT-2.8.	Integrate cultural resources into the sanctuary science plan so that the relevance to cultural heritage is optimized (i.e., include significant resources in research efforts) and impacts are minimized (e.g., from monitoring activities).	Research plan reviewed by the Native Hawaiian subcommittee of the sanctuary advisory council, and additional subject matter experts.	Cultural resources integrated into sanctuary planning.
CT-2.9.	Explore the feasibility of aligning sanctuary boundaries with traditional Hawaiian ahupua'a boundaries on all islands.	Sanctuary boundaries aligned with ahupua'a boundaries as appropriate.	Integration of traditional management boundaries into sanctuary boundaries.

Objective CT-3:

Facilitate the communication of cultural perspectives on the interconnectedness between traditional Hawaiian practices and natural resource management.

Activity		Output	Outcome
Build Capacity			
CT-3.1.	Partner with Native Hawaiian practitioners to broadly disseminate guidance on cultural heritage and traditional resource management to partner agencies.	Outreach materials and trainings on integrating cultural heritage into management (e.g., *Aloha ʻĀina Guidance Document*).	Coordination with partner agencies to comprehensively integrate place-based cultural perspectives and practices into resource management.
CT-3.2.	Communicate about current sanctuary projects, processes and lessons learned with NOAA staff to support sanctuary-wide initiatives on integrating traditional place-based management approaches (e.g., ONMS maritime cultural landscape approach).	Information sharing for NOAA staff (e.g., webinars).	
CT-3.3.	Communicate about current sanctuary projects, processes and lessons learned with agencies and partners throughout Hawaiʻi, to provide updates and highlight potential collaborations with other place-based projects.	Regular information exchanges with agencies and partners throughout Hawaiʻi.	
Improve Communication			
CT-3.4.	Perpetuate the importance of integrated land and marine resource management in the sanctuary by highlighting the traditional ahupuaʻa management approach.	Disseminate outreach materials including information about traditional ahupuaʻa management.	Heightened understanding of cultural management of natural resources.
CT-3.5.	Perpetuate broad understanding of surfing as a thriving aspect of cultural heritage focusing on the State of Hawaiʻi Surf Reserve on the north shore of Oʻahu for the general public.	Signage, outreach and increased presence at surf locations.	Hawaiian marine cultural heritage perpetuated.
CT-3.6.	Work with partner organizations to increase efforts to perpetuate broad understanding of the Hokulea's World Wide Voyage as a thriving aspect of cultural heritage in Hawaiʻi for the general public.	Executing the ONMS workplan to support Hokulea's World Wide Voyage.	

Activity		Output	Outcome
Best Management Practices			
CT-3.7.	Identify and incorporate existing protocols for managing sensitive cultural information, including guidelines established by the National Historic Preservation Act (Section 304), and other relevant resources, into considerations for managing sanctuary resources.	Compilation of and adherence to existing protocols and guidelines.	Improved treatment of sensitive cultural information by the sanctuary and other management agencies.
CT-3.8.	Gather input from the Native Hawaiian subcommittee of the sanctuary advisory council (SAC) and other sources to inform Best Management Practices (BMP) for the use of sensitive knowledge about traditional practices and places.	Gatherings and workshops to establish best management practices standards for use in sanctuary management.	
CT-3.9.	Broadly disseminate guidance and best management practices to agencies and other interested stakeholders regarding the handling and use of sensitive cultural information.	Best management practices handbook and trainings for sensitive information use.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Living and Evolving Cultural Traditions	(3) Enhance nation-wide public awareness, understanding, and appreciation of marine and Great Lakes ecosystems and maritime heritage resources through outreach, education, and interpretation efforts.	CT1.4. Conduct workshops to facilitate communication and direct interaction between diverse groups of academia and agencies, including traditional and Western science.	Within 2 years, two workshops have been held on traditional Hawaiian cultural perspectives and natural resource management.
		CT-2.6. Coordinate with partners to create a spatial database of historical and biocultural shoreline resources within the sanctuary (e.g., opihi and limu) recognizing their significance for traditional gathering practices and supporting subsistence lifestyles.	Within 4 years, an inventory has been compiled of historical and cultural shoreline resources within the sanctuary.
		CT-3.9. Broadly disseminate guidance and best management practices to agencies and other interested stakeholders regarding the handling and use of sensitive cultural information.	Within 5 years, a best management practices guidebook has been developed for the handling and transfer of cultural information, and distributed to partner agencies.

10.2.2. Maritime Heritage

Ka ulu lā‘au ma kai.

The forest on the seaward side.

Refers to the masts of the ships that came into the harbors of Lahaina or Honolulu.

Desired Outcome

NOAA, the State of Hawai'i, partner agencies, businesses and local communities are engaged in the identification and appreciation of maritime heritage resources in Hawai'i to effectively preserve these resources for the benefit of current and future generations.

Overview

Maritime heritage resources include a diversity of cultural, historical, and archaeological assets. To interpret the maritime heritage resources where actual physical elements exist, maritime cultural landscapes are used as the interpretive framework through which we understand the cultural significance of marine areas within a broader context. The people of Hawai'i have a very intimate connection to the sea. Communities have been formed and been shaped by their marine environment. This close connection has left behind a variety of properties and important locations such as coastal trails, plantation landings, inter-island steamships and many of the historic and cultural resources in Hawai'i. Major events like World War II left behind naval shipwrecks and submerged aircraft. These cultural resources, both pre and post-western contact, comprise a unique record of the past and reflect the human role in the marine ecosystem. Many resources continue to be significant to Hawaiian cultural practitioners today and are often valued by both commercial and non-commercial ocean users, including divers and fishermen.

In the past, consideration of these maritime heritage resources has usually been on an individual site-by-site basis. Management agencies are now engaging in a more holistic and comprehensive appreciation of their significance, seeing these individual sites in the context of larger cultural landscapes. For instance, there may be Native Hawaiian navigation landscapes, cultural access and gathering landscapes, and aquaculture landscapes. There may also be historic period whaling landscapes, naval World War II landscapes, marine transportation landscapes, and ocean recreation landscapes to be considered. Maritime heritage resources associated with these themes contribute to our understanding of cultural landscapes and the value of the marine environment. However, the educational and socio-economic potential for these resources has not been realized. The existing state and federal preservation laws intended to protect such sites (the most relevant being Hawai'i Revised Statutes Chapter 6E, National Historic Preservation Act (NHPA), Abandoned Shipwreck Act, and the Sunken Military Craft Act) are generally unfamiliar to the public and may or may not be complied with. The protection of historical, cultural, and archaeological resources is an important part of the National Marine Sanctuaries Act (NMSA). Today the sanctuary supports existing state and federal preservation laws and seeks a better way of cooperating with communities in marine stewardship and preserving our many human ties to the marine environment.

The *Maritime Heritage Action Plan* outlines how the sanctuary seeks to characterize and preserve maritime heritage resources within sanctuary waters. Sanctuary staff plan to coordinate with local experts to create a maritime heritage resource inventory to inform priority management areas. The sanctuary will collaborate to monitor and assess these maritime heritage resources to determine change over time. The sanctuary will seek to increase awareness about these critical resources by targeting education at youth groups, university students, and ocean users (i.e. recreational divers). Staff will also continue to host trainings and workshops for ocean managers to enhance their knowledge of maritime heritage resources and related laws.

Related 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 4

Perpetuate cultural heritage by integrating cultural perspectives into sanctuary programs and using them to guide future management decisions.

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.

Objective MH-1:

Characterize maritime heritage resources found in sanctuary waters.

Activity		Output	Outcome
Gather Information			
MH-1.1.	Gather maritime heritage resource information related to cultural landscapes of Hawai'i, both pre- and post-western contact.	Inventory of maritime heritage resources (e.g., articles, publications, and manuscripts).	A more diverse inventory of maritime heritage resources for potential management actions.
MH-1.2.	Characterize cultural resources within the sanctuary using available data including National Register of Historic Places (NRHP) criteria, *Aloha 'Āina Guidance Document*, and community input.	Report characterizing maritime heritage resources within the sanctuary.	
MH-1.3.	Create GIS-based maritime heritage resource inventory tool suitable for sanctuary planning, and formulate agreement to share data with appropriate agencies.	Maritime heritage resource inventory tool.	
Assess Resources			
MH-1.4.	Conduct or facilitate remote sensing surveys to locate potential maritime heritage resource sites within sanctuary waters.	Data collected by magnetometer, ROV, and side scan sonar.	A more comprehensive understanding of maritime heritage resources in the sanctuary through assessments.
MH-1.5.	Conduct or facilitate initial diving resource assessments to characterize and prioritize new maritime heritage discoveries.	Photographs, measured sketches, and diver site data.	
MH-1.6.	Establish sustainable, periodic maritime heritage resource monitoring program for measuring impacts at selected locations in the sanctuary.	Multi-island dive and assessment program.	
MH-1.7.	Continue to facilitate archaeological and cross-disciplinary site investigations of selected locations within the sanctuary in collaboration university and agency partners.	Site archaeological survey data in conformance with state and federal guidelines.	
MH-1.8.	Work with the State Historic Preservation Division to nominate appropriate resource sites and districts within or adjacent to sanctuary waters to the state and national registers of historic places.	NRHP and HRHP nomination applications.	Increased recognition of historic places within the sanctuary.

Objective MH-2:

Raise awareness and appreciation for the significance of maritime heritage resources within and adjacent to sanctuary waters.

Activity	Output	Outcome
Improve Communication		
MH-2.1. Create and disseminate specific maritime heritage outreach materials to the general public featuring maritime heritage resources and resource preservation.	Outreach materials (e.g., websites and brochures).	Increased appreciation for the maritime heritage of the Hawaiian Islands through sanctuary outreach efforts.
MH-2.2. Engage schools and youth groups in maritime heritage outreach opportunities including presentations, waterfront and ship visits, and diving tours of near shore heritage sites.	Increased engagement opportunities for students.	
MH-2.3. Assess the statewide contribution of maritime heritage diving sites and maritime heritage messaging to the recreational diving industry.	An assessment of the value of maritime heritage sites.	
MH-2.4. Educate the sport diving community on diving protocols for selected (non-sensitive) public-access sites and engage them in resource preservation and monitoring.	Engagement of sport diving community.	Increased engagement with the dive industry, including voluntary compliance.
MH-2.5. Promote pilot shipwreck trail project by engaging local dive shops.	Successful implementation of shipwreck trail.	
Build Capacity		
MH-2.6. Establish and lead Nautical Archaeology Society (NAS) courses for public sport divers.	NAS courses hosted.	Increased maritime heritage educational opportunities.
MH-2.7. Support initiatives to increase the capacity of UH science divers in maritime archeology in collaboration with UH Marine Option Program (MOP).	Contribution to Maritime Archaeology Survey Techniques (MAST) course, the annual maritime heritage symposium, and MOP.	
MH-2.8. Facilitate Heritage Awareness Diving seminars (HADS) for dive shops and dive industry operators.	Dive trainers and shop staff introduced to heritage preservation benefits and protocols.	Increased appreciation and understanding of maritime heritage.
MH-2.9. Engage existing university and community college academic departments (e.g., anthropology, archaeology, and history) in maritime heritage resource survey and preservation.	Academic programs introduced to opportunities in the maritime heritage field.	

Objective MH-3:

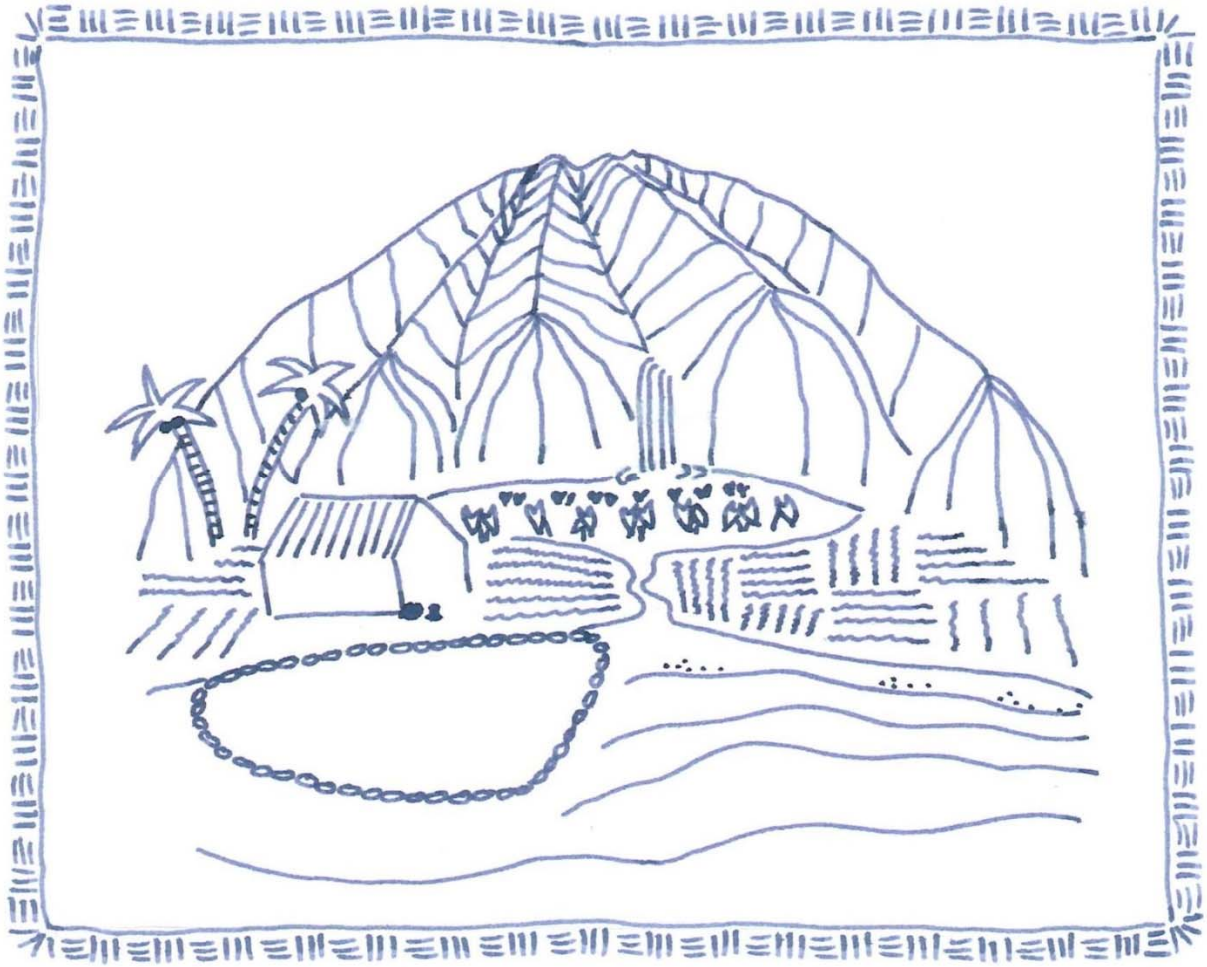
Preserve and protect for future generations the maritime heritage resources found within sanctuary waters.

Activity		Output	Outcome
Enhance Collaboration			
MH-3.1.	Facilitate a regular maritime heritage resource protection inter-agency workshop to enhance awareness about the value and legal status of maritime heritage resources and increase the capacity of partner agencies.	Regular inter-agency workshops on maritime heritage resources.	More effective and efficient preservation and protection of maritime heritage resources.
MH-3.2.	Facilitate a local training program for law enforcement personnel to enhance their knowledge of maritime heritage resources and related laws.	Maritime heritage enforcement training.	
MH-3.3.	Establish an agreement between Office of National Marine Sanctuary (ONMS) and the State of Hawai‘i for more efficient management of maritime heritage resources within the sanctuary, including data development and sharing agreements as well as survey and inventory activities.	Agreement between ONMS and the State of Hawai‘i for increased cooperation and coordination.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Maritime Heritage	(3) Enhance nation-wide public awareness, understanding, and appreciation of marine and Great Lakes ecosystems and maritime heritage resources through outreach, education, and interpretation efforts.	MH-1.3. Create GIS-based maritime heritage resource inventory tool suitable for sanctuary planning, and formulate agreement to share data with appropriate agencies.	Within 3 years, a GIS-based inventory tool has been developed and populated with heritage resource data from archives and fieldwork.
		MH-1.5. Promote pilot shipwreck trail project by engaging local dive shops.	Within 2 years,the sanctuary has developed a partnership with at least three Maui dive shops to develop, desgin and start to implement the heritage trail concept.
		MH-3.1. Facilitate a regular maritime heritage resource protection inter-agency workshop to enhance awareness about the value and legal status of maritime heritage resources and increase the capacity of partner agencies.	Every 2 years, one interagency maritime heritage resource preservation workshop has been held to increase the information exchange and improve management approaches for protection of maritime heritage resources.
		MH-3.2. Facilitate a local training program for law enforcement personnel to enhance their knowledge of maritime heritage resources and related laws.	Every 5 years, one maritime heritage resource protection enforcement training workshop has been facilitated by sanctuary staff.

10.3. Transitioning Towards Sustainability



The *Transitioning Towards Sustainability* thematic area describes how the sanctuary plans to engage with stakeholders and communities to achieve mutually beneficial outcomes. Oceans are integral to the lives, lifestyles, and livelihoods of the people of Hawai‘i. The social climate in Hawaii is changing, leading to expanding interest and actions by stakeholders and community members to become actively involved in understanding, caring for, restoring, and stewarding coastal areas. As a place-based management agency, the sanctuary program strives to be integrated into the communities that are adjacent to the sanctuary boundaries and whose waters are part of these communities. The sanctuary program can be a partner with businesses and communities to effectuate change toward a collective vision for the future.

The State of Hawai‘i defines sustainability as a Hawai‘i that respects the culture, character, beauty and history of the state’s island communities, strikes a balance among economic, social and community, and environmental priorities, and meets the needs of the present without compromising the ability of future generations to meet their own needs (Hawai‘i 2050 Sustainability Plan, 2008). In 2005, the state began a two-year effort to develop the *Hawai‘i 2050 Sustainability Plan*, a statewide initiative to address natural resource use, population change, economic development, water and social issues. The plan seeks to ensure that natural resources are responsibly and respectfully used, replenished and preserved for future generations, and island cultures and values are thriving and perpetuated. The *Hawai`i Green Growth Initiative* is a group of Hawai‘i leaders working together across government, business, academia and civil society to achieve targets in energy, food and ecosystem security for a sustainable, resilient and prosperous future in the Hawaiian Islands.

The four action plans in the *Transitioning Towards Sustainability* thematic area are *Community Partnerships* (CP), *Ocean Literacy* (OL), *Sustainable Use* (SU), and *Ecosystem Benefits and Values* (BV). All of the action plans describe how the sanctuary seeks to engage the public to promote responsible stewardship of the marine environment. The *Community Partnerships* action plan specifically outlines opportunities for stakeholders and communities to engage in sanctuary programs through the statewide volunteer program, the community-based sanctuary advisory council, and various natural and cultural resource management initiatives. The *Ocean Literacy* action plan describes how the sanctuary is going to integrate ecosystem-based management into an already thriving and successful education and outreach program to promote and enhance ocean stewardship. The *Sustainable Use* action plan describes how the sanctuary will collaborate with local businesses and tour operators in Hawai‘i to specifically promote the sustainable use of the marine environment. And finally, the *Ecosystem Benefits and Values* describes how the sanctuary will assess the economic, socio-cultural, and ecological benefits provided by marine resources, and integrate that information into management planning and education programs.

Transitioning Towards Sustainability

10.3.1. Community Partnerships

E lauhoe mai na wa‘a; i ke kā, i ka hoe, i ka hoe, i ke kā; pae aku i ka ‘āina.

Everybody paddle the canoes together;

Bail and paddle, paddle and bail, and the shore is reached.

Pitch in with a will, everybody, and the work is quickly done.

Desired Outcome

Informed and empowered human communities that are actively engaged in dialogues and initiatives to facilitate an integrated management approach that perpetuates a healthy co-existence between humans and the marine environment.

Overview

The transition of the sanctuary from a single-species focus to an ecosystem-based management approach presents a tremendous opportunity for a higher level of community engagement and an added responsibility to reach out to a more diverse set of stakeholders. An ecosystem-based management approach allows for enhanced agency-community partnerships to address broader marine resource issues, and to work together in areas of mutual concern. This increased potential for enhanced collaboration can build local community capacity to effectively address areas of common interest. The sanctuary recognizes that each community and island is unique, where no single approach fits all, calling for the need for flexibility, transparency, open engagement, and ground-up collaboration. Community partnerships promote collaboration between sanctuary staff and the community to exchange and increase knowledge in a manner that is reciprocal and mutually beneficial. In addition, the sanctuary will engage in a participatory approach for community-based management that integrates traditional and western management perspectives.

Coastal communities around the state are increasingly recognizing the value of collaborating with local organizations and state and federal agencies, to become more engaged stewards of their environment. The sanctuary can build upon its 20-year history of successful community involvement and partnerships to complement and support community efforts in order to attain shared visions and goals. As a place-based program with resident staff on the islands of Hawai‘i, Maui, O‘ahu, and Kaua‘i, the sanctuary has established strong relationships on each island that will continue to be strengthened. Additionally, the community-based sanctuary advisory council will continue to play an instrumental role in facilitating the dialogue between sanctuary staff, communities and ocean use stakeholder groups. Sanctuary staff will continue to foster active volunteers to become committed ocean stewards, who are an indispensable resource to the sanctuary, while promoting a reciprocal learning experience. Additionally, the sanctuary will collaborate with communities by providing training to increase their knowledge and understanding of sanctuary resources, and facilitate coordination and communication with federal and state agencies.

The *Community Partnerships Action Plan* describes the different ways that the sanctuary will engage communities and stakeholders in Hawai‘i. The sanctuary plans to work directly with communities located adjacent to the sanctuary to target programs and specific initiatives to meet community needs and build replicable models of community-based ecosystem management. The sanctuary will continue to provide resources, such as moon and tide calendars, and support opportunities for traditional learning exchange. Volunteer programs will continue to be critical to sanctuary management and sanctuary staff will continue to identify and coordinate new and innovative opportunities to engage volunteers, as well as recognize their commitment to sanctuary programs. The community-based Sanctuary Advisory Council will continue to provide recommendations to sanctuary management on cultural and marine resource protection issues. Sanctuary staff will help facilitate council operations and working groups and provide avenues for council members to provide advice.

Related Goals

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 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.

Objective CP-1:

Work collaboratively with communities on implementing both traditional and science-based management approaches to enhance learning and stewardship opportunities and increase protection of resources within the sanctuary.

Activity		Output	Outcome
Enhance Collaboration			
CP-1.1.	Collaborate with targeted individual communities to determine how sanctuary programs can support site-specific community-based initiatives, processes and approaches to natural resource management.	Framework for the sanctuary to support site-specific community plans.	Increased capacity for effective community engagement in management of marine and cultural resources within the sanctuary.
CP-1.2.	Continue to build replicable planning models of community-based ecosystem management that use both traditional Hawaiian practices along with science-informed western management approaches.	Management processes and models to be adopted by and adapted to other communities beyond the initial pilot project.	
Build Capacity			
CP-1.3.	Provide support to build the capacity of communities to engage in effective management of marine and cultural resources within the sanctuary.	Trainings, workshops or other forums to effectively build the skills and knowledge capacity of local communities to engage in cooperative management processes.	Increased capacity for effective community engagement in marine resource management.
Reciprocal Learning			
CP-1.4.	Assist communities in creating place-based moon and tide calendars, seasonal calendars, and other products to better understand reproductive and life history cycles of fisheries resources and to inform management and best practices.	Creation of calendars and other products as a management tool.	Enhanced community capacity resulting from shared lessons learned about ecosystem-based management and other best practices.
CP-1.5.	Develop learning exchange opportunities between Hawaiian island communities and the greater Pacific islands communities to foster a greater understanding of place-based and traditional management approaches.	Development of resource tools and opportunities for sharing lessons learned and best management practices applied in islands nations.	

Objective CP-2:

Increase engagement of communities in stewardship opportunities and active participation in sanctuary management by enhancing and expanding the sanctuary's volunteer program.

Activity		Output	Outcome
Build Capacity			
CP-2.1.	Develop and implement an incremental program for recruitment and training of new volunteers on each of the islands, including a retention plan for maintaining an informed and committed volunteer base.	Program development and implementation resulting in increased number of trained volunteers.	Expanded volunteer base to support effective sanctuary management.
CP-2.2.	Acknowledge volunteer time, skills, accomplishments, and dedication to the sanctuary through a regular and on-going volunteer recognition program.	Enhanced volunteer recognition program including awards and appreciation events.	Long-term retention of experienced volunteers and ocean stewards to support sanctuary initiatives.
CP-2.3.	Provide continuing education and training opportunities and materials for volunteers on current issues and approaches to ecosystem-based management, to further their engagement and expertise, and enhance their interpretative skills.	Well-trained volunteers, presentations, and volunteer information guides.	Provide opportunities to fill sanctuary management gaps by providing volunteers with additional opportunities for engagement in effective management of marine and cultural resources within and around the sanctuary.
CP-2.4.	Pursue opportunities for sanctuary volunteers to participate in activities collaborating within as well as with partner organizations and community-based projects.	Expanded list and position development of volunteer opportunities by the sanctuary and partner organizations and agencies.	
CP-2.5.	Develop "train the trainer" programs to engage sanctuary volunteers to become leaders of stewardship activities, and train and take leadership responsibilities over other volunteers.	Trained volunteers to lead projects to increase volunteer engagement.	

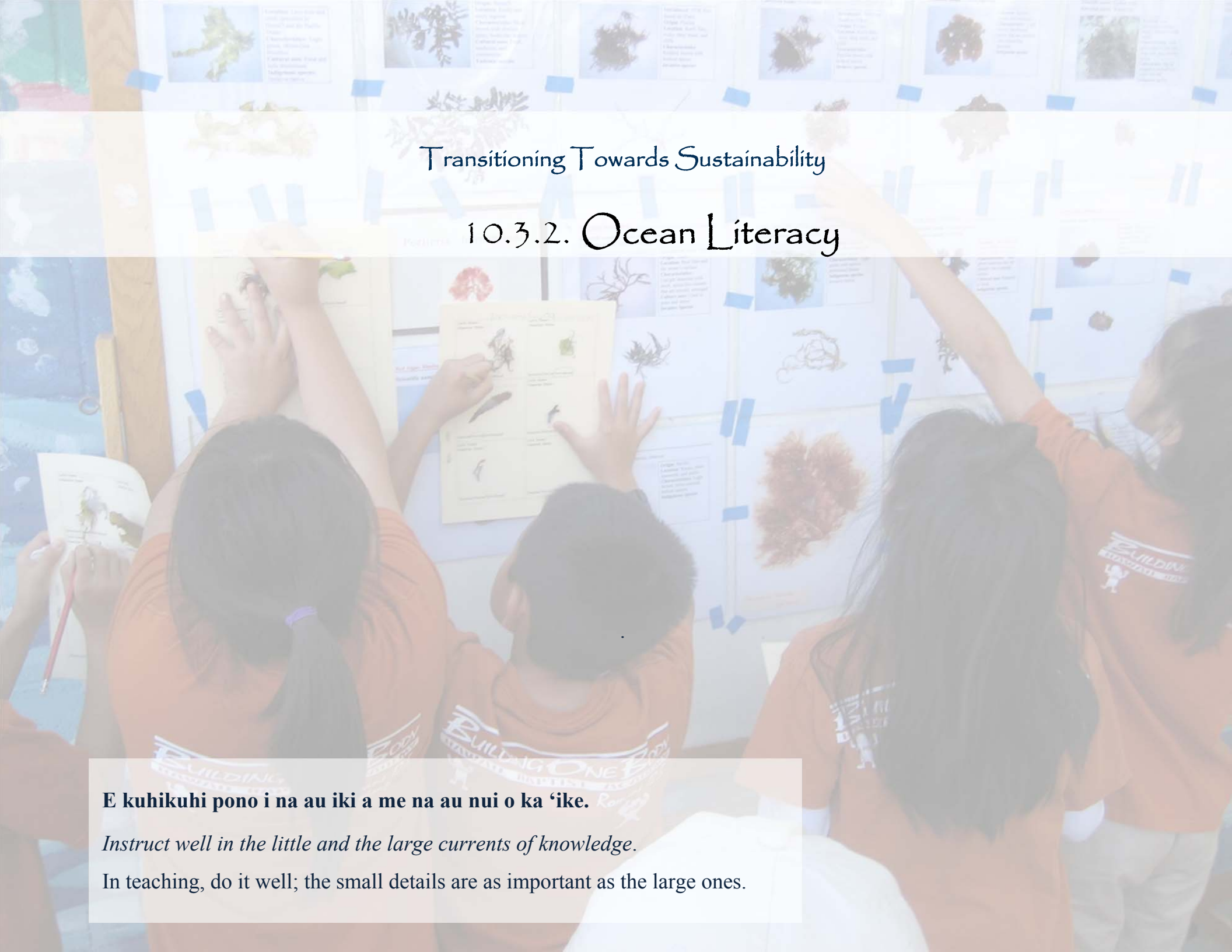
Objective CP-3:

Facilitate dialogue with communities and stakeholders through the community-based sanctuary advisory council (SAC) as a platform for staying current with sanctuary activities and issues and making recommendations to sanctuary management that reflect the collective interests of the SAC.

Activity		Output	Outcome
Planning and Organizing			
CP-3.1.	Coordinate the sanctuary advisory council operations, including organization of regular meetings.	Operational support to the council.	Well-coordinated, active, and engaged advisory council making recommendations on sanctuary decisions.
CP-3.2.	Ensure the sanctuary advisory council has multiple avenues and opportunities to discuss important cultural and marine resource protection issues in the sanctuary.	Operational support of subcommittees and working groups.	
CP-3.3.	Periodically review and update *Sanctuary Advisory Council Charter* and assess council membership.	Council membership that ensures appropriate and relevant community and stakeholder representation; reviewed council charter every 5 years	Sanctuary advisory council that embodies relevant representation to address current and emerging sanctuary issues.
Enhance Collaboration			
CP-3.4.	Increase coordination efforts between sanctuary, Papahānaumokuākea Marine National Monument (PMNM), and the National Marine Sanctuary of American Samoa (NMSAS) sanctuary advisory councils.	Participation and presentations at meetings leading to enhanced information exchange.	Improved coordination between sanctuary advisory councils in the Pacific Islands Region to become a more functional region.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Community Partnerships	(3) Enhance nation-wide public awareness, understanding, and appreciation of marine and Great Lakes ecosystems and maritime heritage resources through outreach, education, and interpretation efforts.	CP-1.2. Continue to build replicable planning models of community-based ecosystem management that use both traditional Hawaiian practices along with science-informed western management approaches.	Within 2 years, a place-based pilot project in one community located adjacent to the sanctuary has been designed, a partnership established, and the pilot ready for the early stages of implementation.
		CP-2.4. Pursue opportunities for sanctuary volunteers to participate in activities collaborating within as well as with partner organizations and community-based projects.	Within 2 years, three new opportunities for sanctuary volunteers have been identified and articulated on each island with a sanctuary presence.
		CP-3.1. Coordinate the sanctuary advisory council operations, including organization of regular meetings.	Twice a year, the community-based sanctuary advisory council has met.



Transitioning Towards Sustainability

10.3.2. Ocean Literacy

E kuhikuhi pono i na au iki a me na au nui o ka ‘ike.

Instruct well in the little and the large currents of knowledge.

In teaching, do it well; the small details are as important as the large ones.

Desired Outcome

An ocean literate public with increased awareness, knowledge and appreciation of natural and cultural marine resources in order to promote and enhance ocean stewardship.

Overview

Ocean literacy refers to "the understanding of the ocean's influence on you, and your influence on the ocean" (NOAA NOS 2010). NOAA has collaborated with a consortium of partners in the Ocean Literacy Network to develop a series of ocean literacy essential principals and fundamental concepts to help guide education efforts and bring them in line with the National Science Education Standards. An Environmental Literacy Plan has been developed for the State of Hawaii by the Hawaii Environmental Education Alliance and the sanctuary will seek opportunities to incorporate these efforts in the curriculum of public schools in Hawaii. Effective local ocean literacy encourages public involvement in resource protection, increases knowledge about Hawai'i's marine resources in Hawai'i, creates an informed public, and helps nurture future marine science and resource management professionals.

There are limited opportunities for students to learn about marine science in schools in Hawai'i. As such, the sanctuary offers formal education programs to help teachers integrate marine science lessons into their existing curriculum. Sanctuary staff also provide lectures and classroom visits to further engage students. Outside of the classroom, the sanctuary provides place-based experiences where students can participate in afterschool and summer programs. Older students are also invited to apply for internships to learn more about careers in marine conservation and ocean science.

In addition, outreach to the general public is an important means to provide information about the sanctuary and how to protect and become stewards of natural marine resources. The sanctuary employs a number of methods to reach out to the public, including visitor centers, exhibits, interpretive signage, events, presentations, media outlets, brochures, websites and social media. The transition to ecosystem-based management will broaden the scope of the sanctuary's education and outreach programs. Sanctuary staff will work closely with volunteers, partners, and educators to develop programs that reflect a more holistic approach to management. Reaching out to new user groups and audiences requires establishing new partnerships and collaborations to engage in marine conservation education efforts across the state.

The *Ocean Literacy Action Plan* describes the education, outreach, and communications activities that the sanctuary plans to undertake to increase public awareness about the marine environment and ecosystem-based management. The sanctuary will integrate new key messages about marine ecosystems into existing outreach materials and activities and engage with partners to develop new displays and exhibits for public areas and visitor centers. Improvements to the existing website and increased presence on social media will serve to broaden awareness about the sanctuary. Sanctuary communications will leverage existing media resources and employ innovative media tools, including producing news segments and participating in film festivals, to engage new audiences. Sanctuary staff will continue to provide formal and informal education opportunities to students and teachers, including internship programs for students and a student-based Sanctuary Ocean Count program. The sanctuary will consider opportunities to expand Ocean Awareness Training (OAT) to additional islands and to offer trainings tailored for specific audiences.

Related Goals

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 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.

Objective OL-1:

Target audiences with specific messages to enhance their understanding of ecosystem-based management to change the relationship of users with the sanctuary.

Activity	Output	Outcome
Improve Communication		
OL-1.1. Develop targeted messages for visitors, ocean users, and local communities about the ecosystem of the sanctuary.	Specific targeted outreach messages to affect behavior.	Expand sanctuary messages to new and broader audiences with timely and relevant information to strengthen their relationship and awareness of the sanctuary.
OL-1.2. Showcase ecosystem-based management as the centerpiece for new displays and exhibits in order to redefine the sanctuary from managing humpback whales to ecosystem-based management.	Targeted messaging integrated into displays and exhibits at key sanctuary viewing points for visitors, ocean users, and local communities.	
OL-1.3. Host a dynamic website that is relevant and reliable resource to understand ecosystem-based management.	Updated and dynamic messages available on the sanctuary website.	
OL-1.4. Create a real-time information exchange about current events in the sanctuary through the use of social media to reach a wider audience on a continuous basis.	Real-time messaging system that keeps people informed about current events.	

Objective OL-2:

Create meaningful and relevant learning and engagement opportunities for a range of individuals to better understand and support management at the sanctuary.

Activity		Output	Outcome
Build Capacity			
OL-2.1.	Integrate Hawaii and sanctuary messages into hands on experiential learning, in the classroom and out in the field, for both students and teachers to make the sanctuary relevant to their learning experiences.	Development of ecosystem-based context through place-based activities, experiential learning, training modules, and materials.	Integrate the concept of ecosystem-based management and the role of communities into the educational experience.
OL-2.2.	Increase opportunities for teachers to participate in workshops that are geared towards improving and understanding the marine and coastal ecosystem in Hawaii and communicating those messages and learning experiences in the classroom.	Training, workshops, and materials for teachers focusing on increasing ocean literacy.	
OL-2.3.	Host interns in the sanctuary office to build future leadership for marine conservation.	Meaningful and relevant career opportunity experiences for students.	Building awareness of academic and career opportunities in the marine science field.
Special Projects			
OL-2.4.	Expand and tailor a series of interdisciplinary workshops (*Ocean Awareness Training*) to target audiences such as communities and ocean user groups on all islands with a sanctuary presence.	Development of content for targeted audiences and the implementation of the workshops.	Increase understanding of participants' relationship to the coastal and marine environment and their role in marine conservation.
OL-2.5.	Develop a recognized certification program for individuals who complete a series interdisciplinary workshops that signals their level of knowledge about the coastal and marine environment in Hawaii.	The development and marketing of a certification program.	
OL-2.6.	Evaluate opportunities to improve the effectiveness of the sanctuary volunteer humpback whale monitoring program (*Sanctuary Ocean Count*) on multiple islands and consider collaborative opportunities to expand to new communities on Molokaʻi, Lānaʻi and Maui.	An improved and more effective *Sanctuary Ocean Count* program.	Broad community engagement in sanctuary monitoring programs to increase awareness about sanctuary resources.

Objective OL-3:

Enhance media communications to amplify current and emerging issues within the sanctuary as well as to keep the sanctuary in the awareness of the broader public.

Activity	Output	Outcome
Improve Communication		
OL-3.1. Develop and implement an integrated communications plan across a wide range of media sources and tools to engage sanctuary constituents and the general public.	Coordinate approach to reaching the broader public through a communications plan that lists a range media sources and tools.	Coordinated and streamlined process for more effective dissemination of sanctuary messages to a broader audience.
OL-3.2. Improve and add to video and photography libraries so that they are readily available and accessible for distribution to local and national media outlets.	Inventory of photos readily available for distribution.	Increased awareness about the ocean and profile for the sanctuary and its role in ecosystem-based management through print media, television, and film.
OL-3.3. Participate in local and national film festivals that promote environmental conservation and ocean stewardship to bring attention to the sanctuary.	Increase exposure of the sanctuary to broader audiences at local and national film festivals.	
Build Capacity		
OL-3.4. Provide communications training to staff, council members and volunteers so that they can effectively communicate sanctuary messages to the media, constituents and the public as a whole.	Staff, council members and volunteers trained communicating sanctuary messages to a range of audiences.	Increased exposure to a broader range of audiences about the sanctuary and the role of management.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Ocean Literacy	(3) Enhance nation-wide public awareness, understanding, and appreciation of marine and Great Lakes ecosystems and maritime heritage resources through outreach, education, and interpretation efforts.	OL-1.1. Develop targeted messages for visitors, ocean users, and local communities about the ecosystem of the sanctuary.	Within 3 years, targeted messages on ecosystem protection directed at visitors, ocean users, and local communities have been incorporated into the outreach and education materials and exhibits used by the sanctuary.
		OL-2.3. Host interns in the sanctuary office to build future leadership for marine conservation.	Every year, at least two formal internship opportunities have been offered on each island with a sanctuary presence.
		OL-2.4. Expand and tailor a series of interdisciplinary workshops (Ocean Awareness Training) to target audiences such as communities and ocean user groups on all islands with a sanctuary presence.	Within 5 years, at least one *Ocean Awareness Training* has been offered on every island with a sanctuary presence.
		OL-2.6. Evaluate opportunities to improve the effectiveness of the sanctuary volunteer humpback whale monitoring program (Sanctuary Ocean Count) on multiple islands and consider collaborative opportunities to expand to new communities on Molokaʻi, Lānaʻi and Maui.	Within 3 years, at least five new *Ocean Count* sites have been established and volunteers trained for Molokaʻi, Lānaʻi and Maui.

10.3.3. Sustainable Use

E ‘ai I kekāhi, e kāpī kekāhi.

Eat some, salt some.

Said to young people: Eat some now and save some for another time.

Desired Outcome

Vibrant coastal communities and economies that promote the sustainable use of the marine environment.

Overview

The sustainable use of ocean ecosystems is an important component of an ecosystem-based management framework. Sustainable use of the marine environment ensures that the natural, cultural and historic resources found in sanctuary waters are not unnecessarily impacted, depleted or permanently damaged. The facilitation of the sustainable use of marine resources and habitats is compatible with resource protection, and is part of the purpose set forth in the National Marine Sanctuaries Act. The National Ocean Policy and the Hawai‘i State Constitution also call for the sustainable use of the ocean ecosystems in Hawai‘i.

To promote sustainable use of an ecosystem-based sanctuary, it is necessary to understand the types and patterns of use and how these uses may impact resources in the sanctuary, as well as the communities the sanctuary serves. Community input, indigenous science, cultural knowledge, socioeconomic values and biocultural connections have often been missing from natural resource management and need to be better incorporated (Watson 2012). New and different expertise and engagement with a broader range of stakeholder groups are needed by the sanctuary to engage in the reciprocal learning process needed to effectively promote sustainable use.

The sanctuary seeks to promote the sustainable use of marine resources in Hawai‘i by supporting programs and businesses that prioritize sustainable use of the marine environment and resource protection. The sanctuary has already been engaged in a number of collaborations and initiatives to achieve this goal. Starting in 2013, the sanctuary engaged with the Hawai‘i Tourism Authority (HTA) to expand ocean awareness training for business owners who operate within the sanctuary. The sanctuary also supports initiatives such as the one at Turtle Bay Resort on the north shore of O‘ahu to conserve marine resources through public education and conservation initiatives. On Maui, sanctuary staff and volunteers support programs at Whalers Village and offer interpretive lectures at the Whalers Village Museum to enhance the visibility of the sanctuary programs and encourage resource protection.

The *Sustainable Use Action Plan* describes how the sanctuary plans to work directly with ocean-based businesses and tour operators to increase awareness about marine resources within the sanctuary and encourage best management practices. The sanctuary will support existing voluntary recognition programs and explore opportunities to develop a sanctuary smart hotels initiative. Additionally, the sanctuary will offer customized trainings for ocean-based businesses and tour operators to encourage voluntary compliance. Other proposed activities include promotional videos and sanctuary apps to promote sustainable use of the marine environment by both residents and visitors.

Related 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 3
Inspire local stewardship by engaging communities and stakeholders in cooperative conservation to increase place-based protection of ocean resources.

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.

Objective SU-1:

Make the sanctuary an integral part of the visitor experience by enhancing their appreciation for and engagement with sanctuary resources.

Activity		Output	Outcome
Enhance Collaboration			
SU-1.1.	Engage and develop a working relationship with ocean-based businesses and tour operators, who conduct their activities within or adjacent to the sanctuary to develop, disseminate, and implement best management practices.	Best management practices for businesses established and implemented by businesses and tour operators.	Businesses and tour operators actively implementing best management practices.
Develop Tools			
SU-1.2.	Identify existing voluntary recognition programs that are consistent with sanctuary goals and consider potential opportunities for collaboration and expansion.	Inventory of relevant voluntary recognition programs in Hawai‘i (e.g., Dolphin SMART, Fish Friendly Business Alliance, Hawai‘i Green Business Program).	Sustainable use of sanctuary resources by businesses realized through voluntary recognition programs.
SU-1.3.	Collaborate with the hospitality industry to develop a sanctuary smart hotels initiative to recognize hotels that promote sustainable use practices that are consistent with sanctuary goals.	Voluntary recognition program established for Hawai‘i hotel industry to ensure the sanctuary remains the centerpiece for the need for best practices.	
Build Capacity			
SU-1.4.	Offer customized training for ocean-based businesses and tour operators, who carry out activities within and adjacent to the sanctuary, to build their awareness about the impacts of the uses and ways to improve their activities on the ocean.	Customized training for businesses and tour operators (e.g., Ocean Etiquette for Business).	Business practices improved from increased awareness of the significance of resources within sanctuary waters.
SU-1.5.	Develop a recognized certification program for individuals who complete a series of customized trainings for ocean-based businesses and tour operators that signals their level of knowledge about the coastal and marine environment in Hawaii.	The development and marketing of a certification program.	

Objective SU-2:

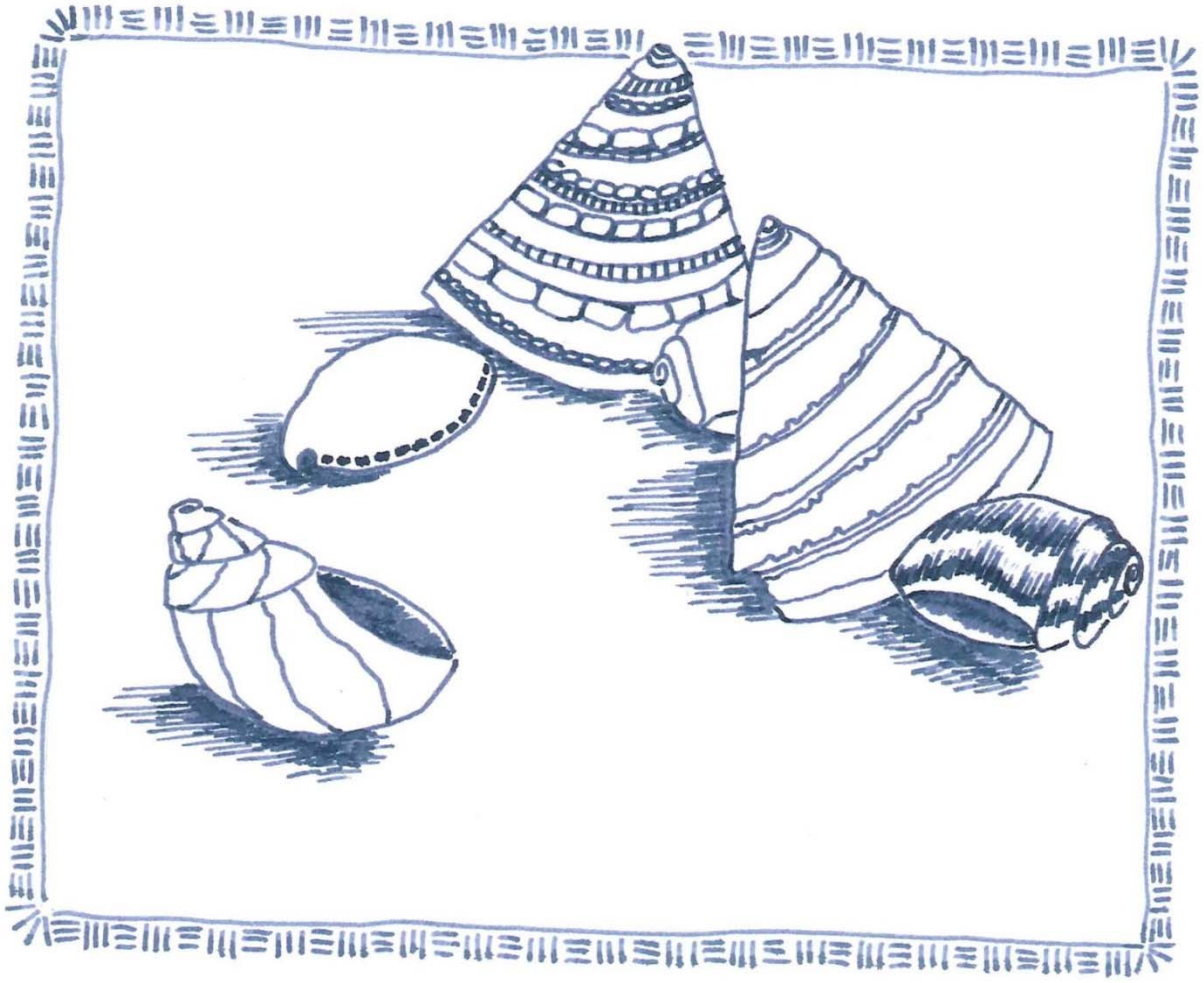
Outreach to the travel and tourism industry and visitors to bring about an awareness and understanding to make the sanctuary an integral part of the visitor experience to enhance their appreciation and engagement with ocean resources.

Activity		Output	Outcome
Improve Communication			
SU-2.1.	Strengthen relationships with the visitor industry (i.e., Hawaii Tourism Authority) to develop and promote communication materials that target visitors to Hawai'i to better understand the role of the sanctuary in enhancing their experience.	Development of visitor communication materials featuring sanctuary messages (e.g., arrival video), that bring awareness to the importance of a healthy marine environment to the visitor experience.	Increased awareness of natural and cultural resources within the sanctuary resulting in a better understanding and behavioral change by visitors and tourism-based businesses.
SU-2.2.	Collaborate with hotels and businesses to incorporate sanctuary messages into their promotional materials, including social media, that conveys the importance about the importance of a healthy marine environment to the visitor experience.	Increased visibility of the sanctuary and value to visitors through promotional materials.	
SU-2.3.	Develop a sanctuary app to allow tourists and visitors to readily access information on sanctuary events, ocean etiquette, volunteer opportunities and sanctuary resources so that visitors better understand the depth and breadth of the role of the sanctuary in Hawaii..	Sanctuary app developed and disseminated for use that connects visitors to sanctuary events and activities.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Sustainable Use	(5) Facilitate human use in sanctuaries to the extent such uses are compatible with the primary mandate of resource protection, through innovative public participation and interagency cooperative arrangements.	SU-1.3. Collaborate with the hospitality industry to develop a sanctuary smart hotels initiative to recognize hotels that promote sustainable use practices that are consistent with sanctuary goals.	Within 5 years, a pilot voluntary recognition program has been developed and marketed by hotels in Hawai'I that promote sustainable use activities.
		SU-1.4. Offer customized training for ocean-based businesses and tour operators, who carry out activities within and adjacent to the sanctuary, to build their awareness about the impacts of the uses and ways to improve their activities on the ocean.	Within 4 years, six *Ocean Awareness Training* for Business courses have been offered on islands with a sanctuary presence and best management practices are adopted as a standard by recipient businesses.

10.4. Sanctuary Focus Areas



The *Sanctuary Focus Areas* thematic area describes actions that will be taken at specific sanctuary locations to assess and implement the appropriate place-based management approaches and improve the overall health of the marine environment. All national marine sanctuaries are unique places worthy of special protection. However, different physical locations within the sanctuary have differing degrees of ecosystem health, human use and community needs, and cultural settings. Therefore, the sanctuary is proposing specific place-based management actions that best address the management needs of those individual areas. The waters around Niʻihau island, and the waters off of Pīlaʻa on Kauaʻi island, Southern Maui Nui between southeast Lānaʻi and southwest Maui, and Maunalua Bay off Oʻahu island, were selected for special place-based management actions because they each represent a unique environment within the sanctuary. Niʻihau island provides a unique example of a sentinel site for research within the sanctuary. The coral reef in front of Pīlaʻa has been exposed to runoff that has severely degraded the ecosystem. The sanctuary plans to explore how traditional management, coupled with western science informed management, can work to alleviate stress and contribute to recovery of the reef. The waters in the southern Maui Nui area are vulnerable to pollution from wastewater and vessel discharge. Various efforts are in place to help reduce vessel discharge, but more information and action is needed. Sanctuary engagement in this effort will include monitoring water quality and promoting alternatives to vessels discharging wastewater within the sanctuary, such as the use of pump out stations. Communities that live adjacent to Maunalua Bay are actively engaged in a range of conservation and restoration efforts. The sanctuary can provide additional support for site-based learning initiatives to enhance community stewardship and increase overall protection of the Bay.

The three action plans in the *Sanctuary Focus Areas* thematic area are *Niʻihau* (SN), *Pīlaʻa* (SP), and *Southern Maui Nui* (SM). Each plan in this thematic area describes specific management actions that sanctuary staff, in collaboration with partners, will take to protect unique ecosystems and special places within the sanctuary. Many of these actions are pilot projects that could eventually be replicated elsewhere in the sanctuary. The *Niʻihau Action Plan* describes specific action that sanctuary management will take to preserve the unique environment and rich cultural history of Niʻihau. The *Pīlaʻa Action Plan* describes the application of both traditional Hawaiian and western science-based management practices to restore and maintain the nearshore ecosystems. The *Southern Maui Nui Action Plan* describes actions to address vessel discharge and improve water quality in the southern Maui Nui area. The *Maunalua Bay Action Plan* describes how the sanctuary seeks to conserve and restore marine resources in Maunalua Bay through strong community partnerships and cooperative place-based planning and education.

10.4.1. Ni‘ihau

Aina Nui o Ni‘ihau piliwale mai o Lehua

Great is the land of Ni‘ihau and Lehua is nearby.

Desired Outcome

The preservation of healthy coastal and marine ecosystems, and the rich cultural history of Ni‘ihau.

Overview

Early indications are that the coastal and marine waters surrounding Ni‘ihau and Lehua are unique, biologically rich, and a largely undisturbed ecosystem that may serve as important natural and cultural transition zone between the main Hawaiian Islands and the Northwest Hawaiian Islands. Though the special features of Ni‘ihau and Lehua have long been recognized by residents, the cultural and natural resources of Ni‘ihau have largely remained a mystery to outsiders and unexplored by western science. The efforts to further understand and protect coastal and marine resources at Ni‘ihau must be done in a way that respects, and is compatible with, the unique culture of the community at Ni‘ihau.

The robust and intact coastal and marine ecosystems surrounding Ni‘ihau and Lehua are the least impacted by human activities than any of the other inhabited Hawaiian Islands. They have the highest fish biomass of the populated Hawaiian Islands and are important habitats for many marine species, including protected species. These ecosystems are natural sentinels of change and may serve as a reference point and a model for assessing and understanding direct and indirect human impacts in the populated Hawaiian Islands.

At the encouragement of the community that lives on Ni‘ihau, the sanctuary assessed the needs, value, and desires for protection and is proposing to incorporate waters around Ni‘ihau and Lehua into the sanctuary. By becoming a part of the sanctuary, the resources and communities of Ni‘ihau and Lehua will have access to additional opportunities offered by sanctuary designation such as research, outreach, and added resource protection to assist in the perpetuation and support of this special Native Hawaiian culture and place. The sanctuary will partner with the Niihauan community and contribute in a stewardship role to the protection of Ni‘ihau and Lehua’s natural marine and coastal resources for the both the cultures that depend on them, and as a trust resource. Through these efforts, the sanctuary will be able to interpret this special place for the public, in a way that respects the community that lives at Ni‘ihau, by sharing knowledge of the ecosystems and cultures that have remained relatively intact, and isolated yet a mystery to much of the outside world.

The *Ni'ihau Action Plan* describes site-specific activities to assess and manage marine resources around Ni'ihau and Lehua. It will be important to better understand the socioeconomic drivers and cultural practices and values on Ni'ihau in order for conservation to enhance economic opportunities in a manner that is culturally sensitive and respectful of local traditions. The sanctuary will engage with local residents and scientists to assess marine habitats, species of concern, and cultural resources, through a process that integrates traditional knowledge and science-based management. The sanctuary will also monitor water quality around Ni'ihau and Lehua to determine change over time. Among these efforts, an emphasis will be on placed-based learning and opportunities to enhance local educational opportunities.

Related 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.

Objective SN-1:

Conduct research to identify, evaluate and better understand the marine resources of Niʻihau and Lehua.

Activity		Output	Outcome
Gather Information			
SN-1.1.	Partner with universities and resource management agencies to identify and characterize locations and distribution of marine habitats, species of concern and cultural resources of Niʻihau and Lehua, using local knowledge and modern science.	Site characterization that includes an inventory and detailed maps of habitats, species of concern and cultural resources of Niʻihau and Lehua.	Better understanding of the need for priority areas to improve resource management through a site characterization.
SN-1.2.	Establish and program to evaluate water quality and assess threats of marine and land based sources of pollution surrounding Niʻihau and Lehua.	Site characterization on the state of and threats to water quality at Niʻihau and Lehua.	
SN-1.3.	Investigate the socioeconomic value and importance of coastal and marine activities, both commercial and recreational, at Niʻihau and Lehua.	Site characterization of the socioeconomic value of resources of Niʻihau and Lehua.	
Build Capacity			
SN-1.4.	Develop partnership with the community of Niʻihau to explore and identify opportunities to involve residents of Niʻihau in natural resource research and monitoring, based on their resource management priorities, while incorporating cultural sensitivity and scientific soundness in the design of the program.	Research and monitoring protocols developed for a citizen monitoring program specific to the needs of Niʻihau, that involves Niʻihau residents (e.g. monk seal haul-out monitoring).	Efficient research supported by community engagement.

Objective SN-2:

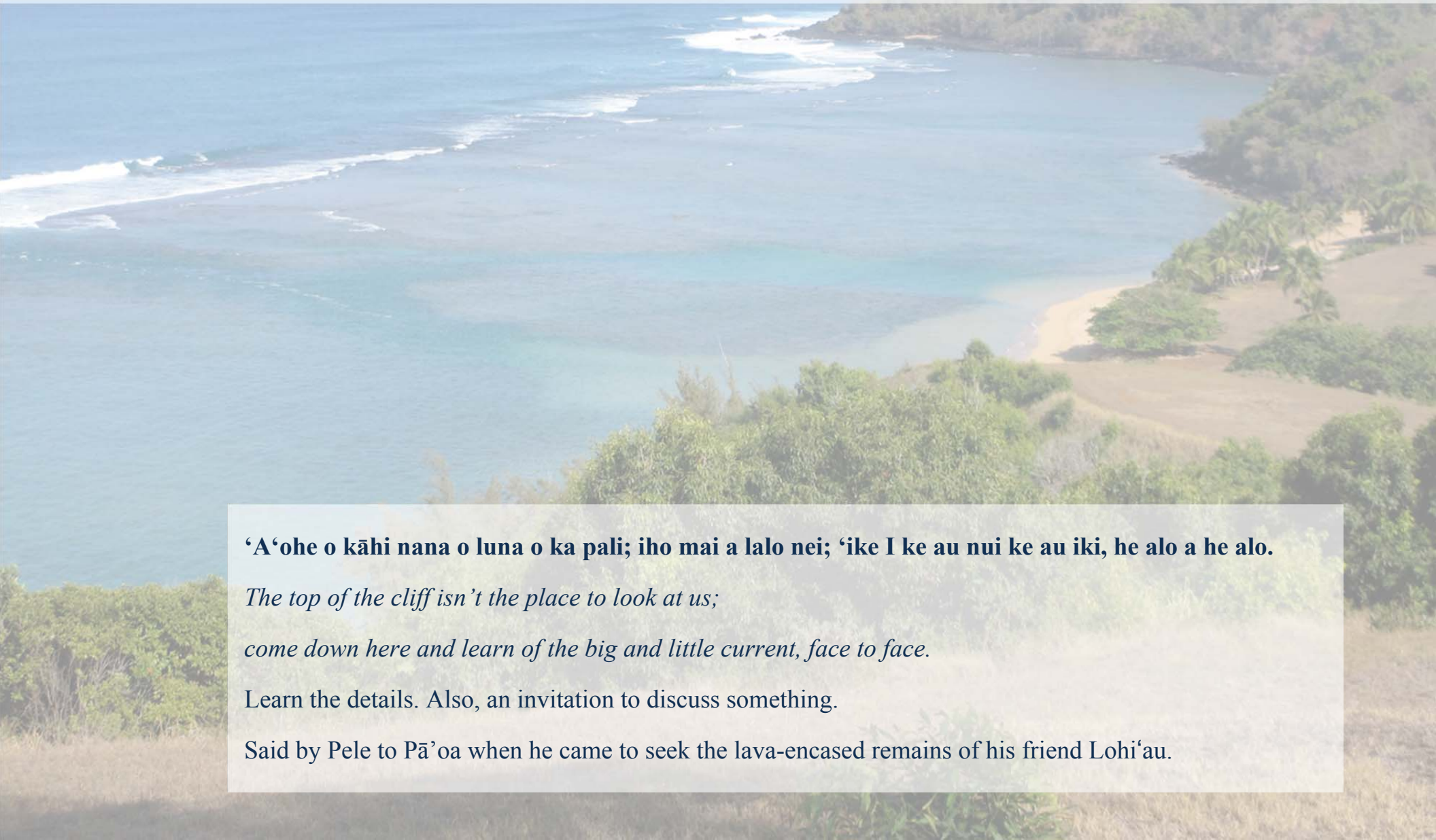
Develop a cooperative relationship with the Ni'ihauan community to increase the protection of priority marine resources on Niʻihau and Lehua.

Activity		Output	Outcome
Build Capacity			
SN-2.1.	Develop and disseminate best management practices for both commercial and recreational ocean users that are interested in conducting activities in and around the waters of Niʻihau and Lehua.	Best management practices materials developed and disseminated on ocean uses at Niʻihau and Lehua.	Wider use of best management practices by ocean users around Niʻihau.
Place-Based Planning			
SN-2.2.	Partner with the Niʻihau community to develop and implement a framework to assess and prioritize the need for regulatory measures to protect sensitive habitats and species.	Guidance framework document establishing place-based needs for proposing regulatory actions to protect species and/or habitats of concern).	Increased protection for habitats and species.
Build Capacity			
SN-2.3.	Develop a protocol with the Niʻihau community, and advised by Hawaiian cultural practitioners, for identifying and protecting sensitive biological and cultural information about Niʻihau.	Guidance document establishing sanctuary protocols for safeguarding sensitive Niʻihau information.	Set standards for safeguarding sensitive information.
Improve Communication			
SN-2.4.	Collaborate with the residents of Ni'ihau develop and distribute education and outreach materials for the broader public that share the uniqueness of Niʻihau in a way that is respectful of and accurately represents the Niʻihau community and culture.	Education and outreach materials on Niʻihau distributed to the broader public.	Increased public awareness of the uniqueness of Niʻihau.
SN-2.5.	Collaborate with the Department of Education and Charter School Commission to develop and distribute education and outreach materials, and deliver targeted outreach.	Education and outreach materials marine resources on Niʻihau distributed Niʻihau and Kauaʻi.	Increased ocean literacy for children on Niʻihau and Kauaʻi.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Operational Foundation	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	SN-1.1: Partner with universities and resource management agencies to identify and characterize locations and distribution of marine habitats, species of concern and cultural resources of Ni‘ihau and Lehua, using local knowledge and modern science.	Within 2 years, a site charecterization has been completed of the location and distribution of marine habitats, species of concern and cultural resources of Ni‘ihau and Lehua.
		SN-2.3. Develop a protocol with the Ni’ihau community, and advised by Hawaiian cultural practitioners, for identifying and protecting sensitive biological and cultural information about Ni‘ihau.	Within 2 years, a guidance document has been developed that establishes protocols for safeguarding sensitive Ni‘ihau information.

10.4.2. Pīlaʻa



ʻAʻohe o kāhi nana o luna o ka pali; iho mai a lalo nei; ʻike I ke au nui ke au iki, he alo a he alo.

The top of the cliff isn't the place to look at us;

come down here and learn of the big and little current, face to face.

Learn the details. Also, an invitation to discuss something.

Said by Pele to Pāʻoa when he came to seek the lava-encased remains of his friend Lohiʻau.

Desired Outcome

A replicable model for applying both traditional Hawaiian and western science-based management practices to restore the health of nearshore ecosystems in the Pīlaʻa ahupuaʻa.

Overview

The Pīlaʻa ahupuaʻa is located on the North Shore of Kauaʻi, east of Kīlauea Point. The marine area contains several small streams, a small estuary, and two coral reefs sheltering inner lagoons that are bisected by a deep channel fronting the stream mouth. The reefs are traditional and customary areas for Hawaiian's to gather a variety of species of reef fish and crustaceans, and in particular from the east reef which is well-known for traditional harvesting of several edible seaweeds.

The Pīlaʻa pilot project aims to restore and maintain these cultural and natural resources while developing a replicable model to apply to other nearshore ecosystems in Hawaiʻi. Combining traditional Hawaiian management practices and western science-informed management practices, the project will implement a restoration and management approach to Pīlaʻa/Piliamoʻo stream, estuary, inner lagoon and fringing reef. The long-term goal of the restoration is returning Pīlaʻa stream to a state that can support optimum reef health and appropriate levels of traditional subsistence utilization of marine resources. Although lagoon restoration is the long-term goal, this initial effort will focus on mitigating impacts resulting from stream alterations, land uses, and changes in riparian vegetative coverage. In addition to being a base for the research, data collection and restoration work, the project site will be used as a field site for students in Hawaiian Studies and other resource management and sustainability-oriented programs at the University of Hawaiʻi at Mānoa Center for Hawaiian Studies and Kauaʻi Community College. Participating students will engage in research and development of traditional and science-based restoration and management approaches, monitoring and evaluation of the recovery of Pīlaʻa stream, estuary, and lagoon, and formulation of a replicable and adaptable management model for combining traditional Hawaiian management practices with western science-informed management for application in other ahupuaʻa.

The *Pīla'a Action Plan* describes a focused sanctuary initiative to restore the nearshore ecosystem in the Pīla'a ahupua'a. The sanctuary plans to work with partners, including the University of Hawaii and Kaua'i Community College, to gather and inventory scientific and cultural information, such as marine and cultural resource assessments, to characterize the current condition of Pīla'a. This information will inform restoration of the coral reef and lagoon habitats. The sanctuary and its partners will then develop and implement a framework for restoration that is consistent with traditional Hawaiian management and science-based resource management. The effectiveness of the restoration process will be evaluated by developing and monitoring indicators and thresholds of change. Using the results of this evaluation, the sanctuary plans to adapt these management practices to other locations within the sanctuary.

Related 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.

Objective SP-1:

Gather and inventory scientific and cultural information to assist in planning and implementing the restoration for the Pīlaʻa pilot project.

Activity		Output	Outcome
Gather Information			
SP-1.1.	Partner with the University of Hawaii and Kauaʻi Community College to research and inventory traditional Hawaiian management practices that are potentially applicable to stream and reef restoration, and long-term management of the Pīlaʻa lagoon system.	Inventory and database of traditional Hawaiian management practices for restoration at Pīlaʻa.	An understanding of traditional Hawaiian resource management practices for Pīlaʻa.
SP-1.2.	Partner with the University of Hawaii and Kauaʻi Community College to research and inventory western science-based resource management practices that are potentially applicable to stream and reef restoration, and long-term management of the Pīlaʻa lagoon system.	Inventory and database of western science-based management practices for restoration at Pīlaʻa.	An understanding of western science-based natural resource management practices for Pīlaʻa.
SP-1.3.	Work with institutional and agency partners to develop a marine cadastre (spatialized data layers) of different county, state and federal jurisdictional authorities and land owners as is relevant to the Pīlaʻa ahupuaʻa.	Inventory, database and layered spatialized maps of different jurisdictional authorities and land owners in the Pīlaʻa ahupuaʻa.	An understanding of the jurisdictional authorities and land owners in the Pīlaʻa ahupuaʻa.
SP-1.4.	Partner with the University of Hawaii and Kauaʻi Community College to characterize the current condition of the Pīlaʻa ahupuaʻa through research of existing information sources, and stream, land and lagoon surveys.	Site characterization of the key components within the Pīlaʻa ahupuaʻa targeted for restoration.	Establishment of target conditions for restoration of Pīlaʻa.

Objective SP-2:

Develop a restoration and learning site planning process framework specifically for Pīlaʻa that integrates traditional Hawaiian and western science-based management approaches.

Activity	Output	Outcome
Place-Based Planning		
SP-2.1. Partner with the University of Hawaii and Kauaʻi Community College to recruit members for a planning and restoration team and a technical advisory team.	Planning and restoration team and technical advisory team.	Buy-in, support and participation by key players in the Pīlaʻa restoration and learning site.
Enhance Management		
SP-2.2. Partner with the University of Hawaii and Kauaʻi Community College to develop and implement the restoration and management goals, processes, and protocols based on traditional and western science-based approaches.	Planned and implemented restoration and management goals, processes and protocols.	Incremental restoration of the Pīlaʻa ahupuaʻa nearshore system.
SP-2.3. Partner with the University of Hawaii and Kauaʻi Community College to measure effectiveness of the Pīlaʻa ahupuaʻa restoration project (both the traditional western management approaches) by developing and monitoring indicators and thresholds of change.	Development of indicators and thresholds and monitoring program designed to measure change.	Monitoring program established to measure effectiveness of management approaches.
Improve Communication		
SP-2.4. Partner with the University of Hawaii and Kauaʻi Community College to develop a communications and documentation team to write a communications plan on the process for the restoration and learning to share with other sites, partners and the media.	Communications plan to document and share progress on the Pīlaʻa pilot project.	Open communication and shared learning about the Pīlaʻa ahupuaʻa pilot project.
Build Capacity		
SP-2.5. Partner with the University of Hawaii and Kauaʻi Community College to evaluate the model and lessons learned from the pilot project to build a replicable model for use in other ahupuaʻa.	Well-documented replicable model and lessons learned from the Pīlaʻa pilot project.	Model made available for application in other ahupuaʻa.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Operational Foundation	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	SP-1.4. Partner with the University of Hawaii and Kauaʻi Community College to characterize the current condition of the Pīlaʻa ahupuaʻa through research of existing information sources, and stream, land and lagoon surveys.	Within 2 years, a site characterization has been completed of the key components within the Pīlaʻa ahupuaʻa targeted for restoration.
		SP-2.2. Partner with the University of Hawaii and Kauaʻi Community College to develop and implement the restoration and management goals, processes, and protocols based on traditional and western science-based approaches.	Within 3 years, a restoration and management plan has been developed, and the first phase of the plan has been implemented for Pīlaʻa.

10.4.3. Southern Maui Nui

Pā ka makani o ka Moa‘e, hele ka lepo o Kaho‘olawe i Mā‘alaea.

When the Moa‘e wind blows, the dust of Kaho‘olawe goes towards Mā‘alaea.

Desired Outcome

Establish a research area in the southern Maui Nui area to better understand and improve water quality.

Overview

Southern Maui Nui is located between the southeast coast of Lānaʻi and the southwest coast of Maui and includes waters of the Auʻ Au Channel, Kealaikahiki Channel, and the ʻAlalakeiki Channel. Māʻalaea harbor is located on the Maui side of the southern Maui Nui area. Eighteen independent tour operators offer boat-based excursions (approximately 30 boats) out of Māʻalaea boat harbor. Recreational activities that take place in the bay and adjacent areas include snorkeling, diving, whale watching, fishing, and dinner cruises. Māʻalaea boat harbor offers a range of facilities including a U.S. Coast Guard station, shore-based pump-out facility, dry-dock, vessel repair, launch ramp, loading dock, and restrooms. During the public scoping process, community members in the Maui area expressed concerns about the potential adverse effects of vessel discharge in Māʻalaea Bay. Vessel discharge can negatively impact biological resources and presents a potential threat to human health and safety for ocean-users.

Sanctuary management proposed a research area in southern Maui Nui to assess the potential impact of vessel discharge to marine resources. The cornerstone of the research area will be a water quality monitoring program to assess pollution from wastewater. This information will be used to help communities and agencies identify threats and begin to work towards possible solutions to eventually mitigate impact to water quality in the southern Maui Nui area. Additionally, this information can be used to inform best practices for businesses and tour operators that take guests out into the bay for recreational activities. The shore-based pump-out facility in Māʻalaea boat harbor was installed to reduce discharge from vessels operating in the area. A designated research area will complement existing community, county, and state efforts to reduce wastewater discharge in the waters of Maui Island. In the long term, this site can also serve as a pilot to explore the feasibility of establishing other research areas within the sanctuary.

The intent of the *Southern Maui Nui Action Plan* is to improve water quality throughout the area over time. In order to improve water quality, the sanctuary plans to engage water management agencies and local community stakeholders by conducting water quality research and monitoring to assess change and identify impacts to water quality. The results of these assessments will be used to inform specific and targeted management actions including opportunities for alternatives to discharge. The sanctuary also hopes to increase awareness about the potential negative impacts of vessel discharge and other pollutants to encourage best management practices such as the increased use of pump-out stations.

Related Goals

Goal 1	Goal 5	Goal 6
Holistically manage biocultural resources in the sanctuary using an ecosystem-based approach to promote the health of the natural and human environment.	Use collaborative and adaptive management approaches to optimize effectiveness.	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.

Objective SS-1:

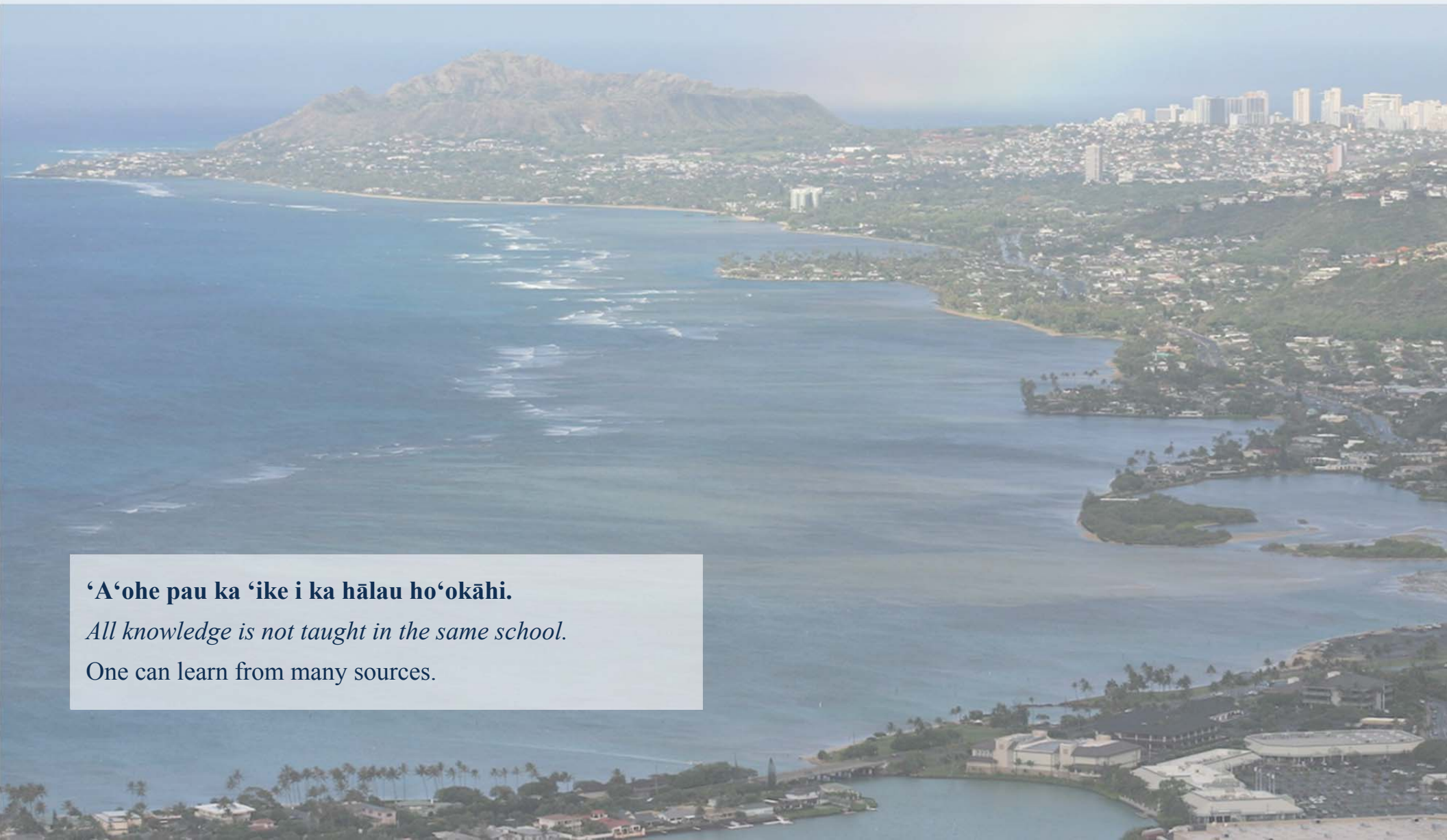
Improve water quality in the sanctuary by reducing wastewater discharge from vessels in the southern Maui Nui.

Activity		Output	Outcome
Place-Based Planning			
SS-1.1.	Collaborate with relevant agencies and communities to develop a plan to assess water quality in the southern Maui Nui area to better understand levels and sources of pollutants.	A water quality research plan developed.	Better informed framework for addressing water quality impacts.
Monitor Resources			
SS-1.2.	Coordinate with ocean-based business and citizen science volunteers to conduct long-term monitoring on water quality to assess and understand the impacts of vessel discharge in the southern Maui Nui area.	Long-term water quality data assessing data and trends over time in the southern Maui Nui area.	Improved understanding of the threats to water quality in Māʻalaea Bay and how the sanctuary will be involved in addressing water quality threats in the southern Maui Nui area.
SS-1.3.	Assess threats to water quality in the southern Maui Nui area.	An inventory of the primary threats to water quality in the southern Maui Nui area.	
SS-1.4.	Determine the role of the sanctuary in addressing threats to water quality in the southern Maui Nui area.	Sanctuary role established.	
Improve Communication			
SS-1.5.	Develop and disseminate outreach materials to both commercial and recreational vessel operators to inform and educate boaters about the need to and feasible options to reduce vessel discharge in the sanctuary.	Informational brochures and maps developed and distributed to boaters in the the southern Maui Nui area.	Improved awareness of alternatives to discharging wastewater and increased use of pump-out stations.
SS-1.6.	Promote the ease and accessibility of the Māʻalaea Small Boat Harbor vessel pump-out station and the value of using it over direct discharge into sanctuary waters.	Public presentations and outreach materials on the impacts of vessel discharge in the sanctuary and the value of using a pump out station.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Operational Foundation	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	SS-1.1. Collaborate with relevant agencies and communities to develop a plan to assess water quality in the southern Maui Nui area.to better understand levels and sources of pollutants.	Within 1 year, a collaborative and coordinated water quality research plan has been developed for the southern Maui Nui area.
		SS-1.3. Assess threats to water quality in the southern Maui Nui area.	Within 2 years, an inventory has been completed of the primary land and marine-based threats and sources of threats to water quality in the southern Maui Nui area.

10.4.4. Maunalua Bay



ʻAʻohe pau ka ʻike i ka hālau hoʻokāhi.

All knowledge is not taught in the same school.

One can learn from many sources.

Desired Outcome

A healthy coral reef and sea grass habitats, abundant marine life and high water quality which is achieved by community kuleana caring for this place with future generations in mind.

Overview

Human activities including poorly planned onshore development, high levels of ocean recreation, and overfishing have contributed to the degradation of nearshore habitats in Maunalua Bay. This degradation, in turn, has catalyzed restoration and education efforts to improve the health of marine life in the bay. The sanctuary proposes to work in collaboration with these efforts to better manage resources in this area of the sanctuary.

Maunalua Bay is located on the southeast shore of the island of Oʻahu, between Lēʻahi (Diamond Head) and Koko Head peak. The embayment itself is often delineated as the waters between Kūpikipikiʻō Point (Black Point) near Lēʻahi to Kawaihoa Point at Koko Head (approximately 6.6 square miles). The bay adjoins two ahupuaʻa across seven watersheds, which are largely urban with impervious surfaces. At least four perennial streams and as many as 52 drainages, most of which have been channelized, feed into the bay. The characteristics of the watersheds and drainages facilitate the rapid movement of storm water, sediments, nutrients and other chemicals directly into the ocean. This runoff threatens the numerous nearshore and offshore coral reefs and sand flats within the bay that support a variety of native species, including endemic seagrass and limu. Invasive marine algae flourish in the nutrient-rich waters of Maunalua Bay and smother native coral reef habitat. Efforts are under way to mobilize volunteers to remove invasive habitat and restore near-shore habitats but additional actions are still needed.

Maunalua Bay hosts a variety of recreational ocean activities including boating, fishing, use of personal water crafts, outrigger canoe paddling, surfing, SCUBA diving, and snorkeling. Several human-induced impacts such as sedimentation, increased nutrients and spread of alien species have impacted parts of the bay over the years, which threaten both marine life and ocean recreation. This has brought community, NGO and management agencies together to support restoration and management efforts. These groups have organized restoration efforts, including invasive algae removal and watershed clean up, and education initiatives to teach the community and other ocean users about environmental impacts, responsible practices, and cultural heritage connections in the bay, especially traditional navigation techniques.

The *Maunalua Bay Action Plan* describes activities that the sanctuary proposes to implement alongside the ongoing initiatives to restore native habitat, increase and sustain marine life, and engage communities and businesses in long term sustainable planning in Maunalua Bay. The sanctuary will work with local and federal agencies to address threats from land-based sources of pollution and invasive marine algae in Maunalua Bay. Sanctuary staff will collaborate with resource scientists to explore innovative opportunities to ensure a healthy coral reef ecosystem with a vibrant marine community. The sanctuary will also support ongoing community-based efforts to

monitor and enforce compliance with sanctuary regulations. Community engagement has been critical to the management of Maunalua Bay so the sanctuary will partner with local community organizations to support ongoing efforts to educate residents and encourage marine stewardship. The activities in this action plan will be implemented in collaboration with Malama Maunalua, the Polynesian Voyaging Society, the University of Hawai‘i, Hawai‘i Pacific University, local and national NGOs, and relevant state and federal agencies.

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Related 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.

Objective SM-1:

Restore the nearshore environment of Maunalua Bay to sustainable levels of health by addressing threats to both water quality and coral reef habitats.

Activity		Output	Outcome
Resource Protection			
SM-1.1.	Support and engage in a community driven process to engage local residents, stakeholders, and community organizations to develop a plan to address key threats to resources in Maunalua Bay.	A marine management plan for Maunalua Bay developed through a community-driven process.	A coordinated planning effort that effectively engages the local community.
SM-1.2.	Continue to support volunteer programs to remove invasive alien algae which will promote restoration of native coral reef habitat in the nearshore environment.	Removal of invasive algae and restoration of native coral reef habitat.	Restoration and recovery of coral reef habitats in Maunalua Bay maintained for now and into the future.
SM-1.3.	Evaluate and implement innovative management approaches to control future invasive alien algae growth in Maunalua Bay.	Proactive approach to addressing problems of invasive alien algae.	
SM-1.4.	Collaborate with scientific experts to measure sediment levels in Maunalua Bay and assess the sources and impacts of sediment at key entry points (e.g., Kuliouou, Wailupe, and Hawaii Kai) into Maunalua Bay.	Scientific measurements and tracking of sources of sediment inputs into Maunalua Bay used to inform management actions.	State and federal water quality standards met through reducing sediment runoff and non-point sources of pollution in Maunalua Bay.
SM-1.5.	Support community activities that reduce impacts from runoff discharged into Maunalua Bay (e.g., Pulama Wai) and broaden community awareness.	More effective community activities to reduce harmful discharge into Maunalua Bay.	
SM-1.6.	Increase collaborative relationships with relevant city and county, state, and federal agencies to take appropriate actions to reduce sediment and non-point sources of pollution flowing into Maunalua Bay through storm drains.	Partnerships that result in infrastructure improvements that measurably reduce flow of sediment and non-point sources of pollution in Maunalua Bay.	

Activity	Output	Outcome
SM-1.7. Coordinate with relevant city and county, state, and federal agencies to assess, review, and respond to new and emerging threats that impact marine habitats and species in Maunalua Bay.	A more coordinated response to new and emerging threats in Maunalua Bay.	Management approaches are evaluated, assessed and adjusted to ensure historic levels of health are achieved in the nearshore environment of Maunalua Bay.
SM-1.8. Evaluate and assess the need to implement additional regulatory approaches to addressing impacts to water quality and the coral reef ecosystem in Maunalua Bay.	An assessment of the potential value of additional regulatory authorities to address impacts to water quality and the coral reef ecosystem in Maunalua Bay.	

Objective SM-2:

Implement best management practices to ensure a healthier, resilient, more effectively and sustainably managed Maunalua Bay for future generations.

Activity	Output	Outcome
Best Management Practices		
SM-2.1. Collaborate with scientific experts to develop both key indicators and associated monitoring programs that signal specific changes or trends in the condition of the resources and the health of Maunalua Bay.	Key indicators of the health of Maunalua Bay developed and measured as a signal to resource managers on the condition of the resources and appropriate management responses.	Sanctuary management provided with targeted information about changes in Mauanlua Bay so that they may respond in a timely and effective manner.to threats and corresponding impacts.
SM-2.2. Conduct a workshop for kupuna and scientists to develop a coastal resiliency plan for Maunalua Bay that incorporates traditional Hawaiian knowledge and recent scientific information, addresses current threats to the marine environment, and plans for potential future coastal hazards.	A coastal resiliency plan for Maunalua Bay that reduces current and future threats to the marine environment in Maunalua Bay.	
SM-2.3. Support sustainable community efforts to monitor compliance with marine resource regulations to enhance the effectiveness of sanctuary management.	Enhanced compliance with sanctuary regulations through community-based programs and increased agency effectiveness.	More effective management of sanctuary resources achieved through greater compliance.
SM-2.4. Support the development of a web-based reporting system to facilitate community reporting of violations of sanctuary regulations.	A web-based geographic information system (GIS) that facilitates reporting of violations and compliance with regulations.	
SM-2.5. Assess the value of habitat enhancement techniques to restore healthy populations of marine species and habitats.	A comprehensive understanding of the range of options to enhance habitats to inform potential management actions.	Marine life and habitats sustained and enhanced through additional management actions.
SM-2.6. Evaluate and assess the need to implement additional regulatory approaches that ensure a healthier, more resilient, and more effectively and sustainably managed marine environment.	An assessment of the potential value of additional regulatory authorities.	

Objective SM-3:

Use education and outreach as a management tool to engage communities and stakeholders in understanding the value of Maunalua Bay, the effects of their actions on Maunalua Bay, and ultimately understanding the importance of making their behavior consistent with the sustainable use Maunalua Bay.

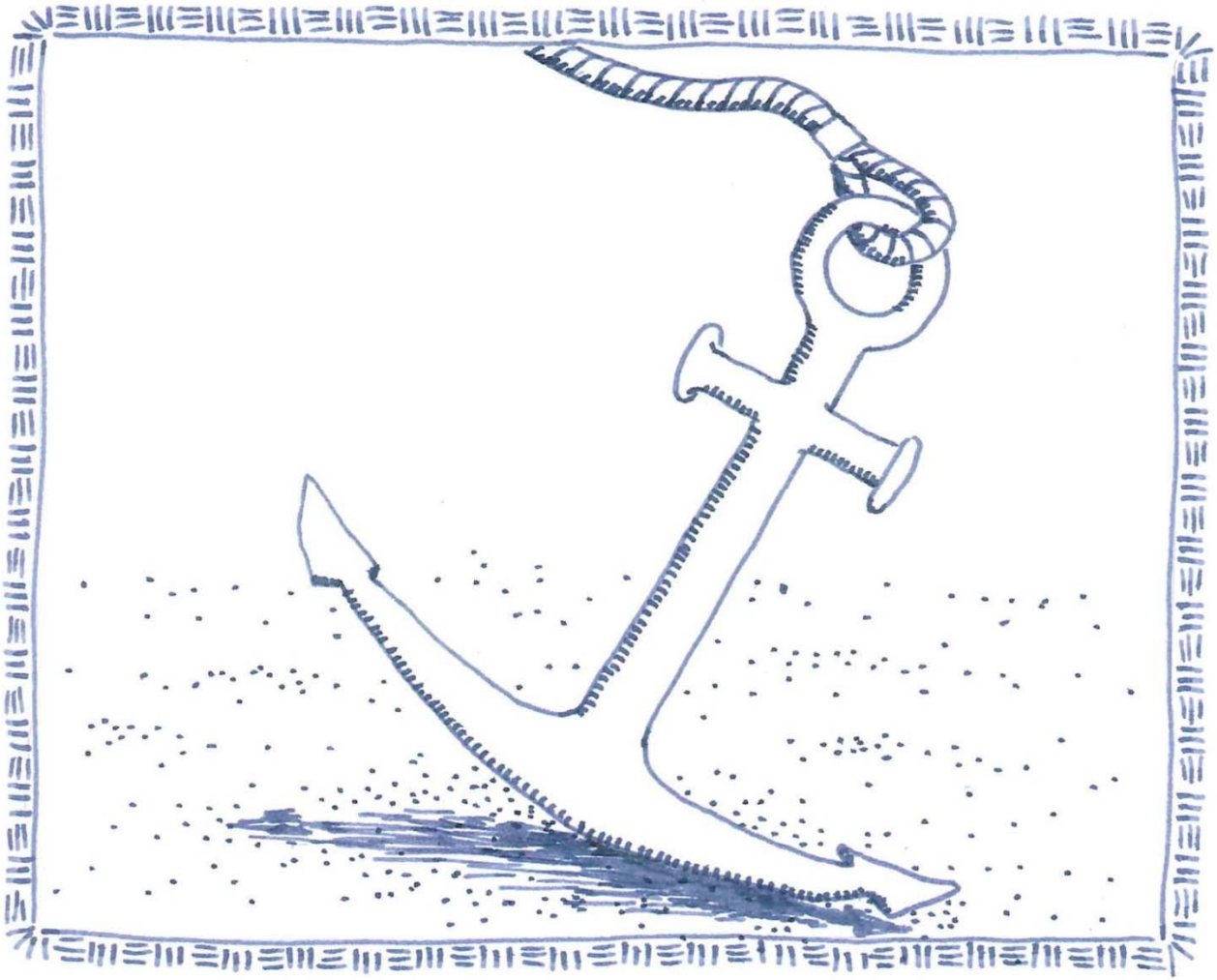
Activity		Output	Outcome
Improve Communications			
SM-3.1.	Develop and implement an effective communications campaign about both the value and threats to Maunalua Bay in order to expand and deepen community understanding of, appreciation for, and commitment to engage in activities to sustain, restore, and enhance marine resources in Maunalua Bay.	Outreach approaches and materials developed that are effective at informing and changing behavior.	Enhanced knowledge, understanding of, and appreciation for marine conservation in Maunalua Bay that results in changes in behaviors and builds next generation of stewards
SM-3.2.	Provide the public, particularly children, with experiential education opportunities about traditional Hawaiian marine activities, including navigation, pono fishing, and traditional Hawaiian resource management practices.	Enhance knowledge understanding of and appreciation for traditional marine customs in Hawaii and their application to interactions with the marine environment.	
SM-3.3.	Work with ocean-based businesses, fishers, and recreational ocean uses that conduct activities within or adjacent to the sanctuary, to understand, develop and embrace the use of best management practices to reduce impacts to marine resources within Maunalua Bay.	Specific and practical best management practices guidelines established and tailored for different ocean user groups.	Long-term sustainable use of Maunalua achieved through engagement with businesses that target ocean users located in proximity to Maunalua Bay.
SM-3.4.	Collaborate with local businesses (e.g., Kahala Hotel, Kona Brew, Whole Foods, etc.) to develop communication avenues and messages used to promote to their customers, clients or guests what they can do to engage in sustainable use of the marine environment consistent with sanctuary management goals.	Outreach to a broader audience through collaborations with key businesses to promote sustainable use of Maunalua Bay.	

Activity		Output	Outcome
SM-3.5.	Work with Polynesian Voyaging Society and other community and non-profit organizations to establish and implement an education area in Maunalua Bay that will serve as a living marine classroom where hands-on and experiential educational activities are offered that promote sustainable uses and traditional Hawaiian marine resource management concepts.	A specific area within sanctuary waters of Maunalua Bay is set aside and serves the community as a living marine classroom.	Enhanced knowledge, understanding of, and appreciation for marine conservation in Maunalua Bay that results in changes in behaviors and builds next generation of stewards.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Operational Foundation	(1) Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques. (4) Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.	SM-1.3. Collaborate with scientific experts to measure sediment levels in Maunalua Bay and assess the sources and impacts of sediment at key entry points (e.g., Kuliouou, Wailupe, and Koko Marina) into Maunalua Bay.	Within 2 years, a sediment levels monitoring program has been established at three entry points into Maunalua Bay.
		SM-2.1. Collaborate with scientific experts to develop both key indicators and associated monitoring programs that signal specific changes or trends in the condition of the resources and the health of Maunalua Bay.	Within 3 years, key indicators of the health of Maunalua Bay have been developed, baseline condition of each resource established, and monitoring program developed to track trends and changes in the health of Maunalua Bay.
		SM-3.3. Work with ocean-based businesses, fishers, and recreational ocean uses that conduct activities within or adjacent to the sanctuary, to understand, develop and embrace the use of best management practices to reduce impacts to marine resources within Maunalua Bay.	Within 4 years, specific and practical best management practices guidelines have been established and tailored for key ocean user groups in Maunalua Bay.

10.5. Ensuring Management Effectiveness

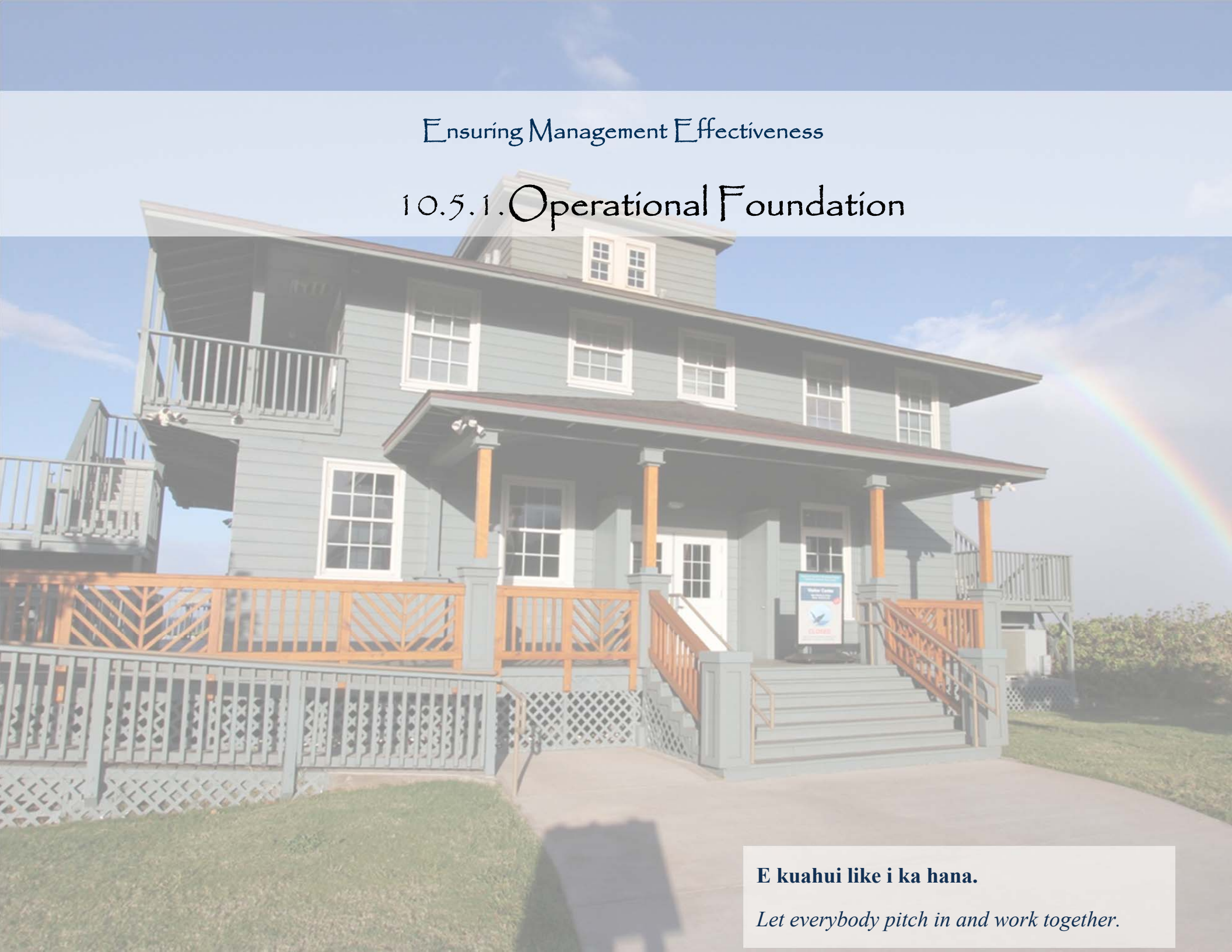


The *Ensuring Management Effectiveness* thematic area describes the means and level of institutional support necessary for sanctuary staff to successfully meet the sanctuary goals and activities detailed in each action plan. This thematic area stands alone from the other sections in this management plan in that it is not necessarily implemented through our program areas (e.g., education and outreach, research and monitoring, policy and planning), but rather functions as a foundation that supports successful resource protection. As a foundational piece or support system for the management plan, the activities outlined below may include partnering, coordinating, collaborating or calling on other entities for support on an as needed basis for purposes such as enforcement, natural resource damage assessment, oil spill response and the like.

The four action plans in the *Ensuring Management Effectiveness* thematic area are, *Operational Foundation* (OF), *Compliance and Enforcement* (CE), *Emergency Preparedness and Damage Assessment* (EP), and *Assessing Progress* (AP). All of these plans detail sanctuary activities to ensure effective management, as well as the health and safety of the marine environment, residents, sanctuary staff and visitors. The *Operational Foundation* action plan describes how effective and well-planned operations, along with appropriate human resources and adequate physical infrastructure will support management of the sanctuary. The *Compliance and Enforcement* action plan describes how the sanctuary will use regulations, guidelines, and best practices to enhance protection of the marine environment within the sanctuary. *Emergency Preparedness and Damage Assessment* outlines plans to protect sanctuary resources from both natural hazards and human-caused incidents or injuries, through coordinated emergency response and damage assessment. The *Assessing Progress* action plan describes a mechanism for performance evaluation to assess progress towards meeting the goals and objectives of this management plan. In 2013, the sanctuary partnered with the *Ocean Tipping Points* project in an effort to incorporate ecological thresholds in the Sanctuary's management, strategy will be integral towards assessing progress and evaluating management effectiveness. The *Ocean Tipping Points* project seeks to understand the drivers and dynamics of past and potential future ecosystem shifts in these environments. The project will establish a robust set of early warning indicators that help provide notice for pending ecosystem shifts, with sufficient time for management responses.

Ensuring Management Effectiveness

10.5.1. Operational Foundation



E kuahui like i ka hana.

Let everybody pitch in and work together.

Desired Outcome

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

Overview

Managing the sanctuary requires a strong operational foundation to support management goals throughout the populated Hawaiian Islands. Support of on-site management and day-to-day operations requires that highly trained and experienced staff are recruited and supported to implement the activities described throughout this management plan. In addition, the appropriate physical infrastructure must be in place to support operations. In order to maximize resources, NOAA and the State of Hawai‘i will continue to coordinate and collaborate, utilizing existing infrastructure within each organization to facilitate effective operations. Successful site operations and programs are achieved through a synergy of personnel and available resources.

The sanctuary has offices and facilities on four islands located in Līhu‘e on Kaua‘i, Honolulu on O‘ahu, Kīhei on Maui, and on Hawai‘i island. The function of these offices is to provide an effective means to coordinate and communicate with communities, partners and other stakeholders. Adequate staff and infrastructure are critical to successful sanctuary management, providing for research and monitoring, resource protection, and education and outreach programs.

Due to the overlapping goals of NOAA and the State of Hawai‘i, the sanctuary can benefit from increased sharing of resources such as boating facilities, vehicles, offices and staff support. The sanctuary works with a number of different agencies, offices and organizations to enhance collaborations to address objectives in the management plan. In order to facilitate some of these collaborations, staff from these organizations are co-located in sanctuary offices. This action plan presents activities designed to ensure the required staffing and training, facilities and vessels, and safety and security are in order to support management priorities.

Objective OF-1:

Provide ample administrative and budgetary support to ensure effective management of the sanctuary.

Activity		Output	Outcome
Support Management Implementation			
OF-1.1.	Produce an annual operating plan that reflects all sanctuary programmatic efforts for the fiscal year based on the management plan, the budget and resources provided by NOAA, the State of Hawai‘i, and other sources.	Annual operating plan.	Planned, assessed, documented, and reported implementation of management plan.
OF-1.2.	Oversee financial administration and use contracts, memorandum of agreements (MOA), grants, acquisitions and administrative functions using federal and State of Hawai‘i guidelines, as appropriate to implement the annual operating plan and the management plan.	Contracts, MOA, grants and acquisitions.	
OF-1.3.	Develop and submit reports to the Office of National Marine Sanctuaries headquarters and the State of Hawai‘i as required to assess progress towards implementation of priority programs and meeting the goals and objectives if the management plan.	Progress reports and information submitted to ONMS and State of Hawai‘i.	
OF-1.4.	Identify and pursue external funding opportunities to supplement the budgets provided by NOAA and the State of Hawai‘i, including grants and collaborations with partner agencies and organizations.	Grants and other funding sources applied for and secured.	

Objective OF-2:

Attract, support and retain highly skilled staff to implement the activities of the management plan.

Activity		Output	Outcome
Build Capacity			
OF-2.1.	Develop and implement a staffing plan to support and maintain highly skilled staff to implement and meet the goals and objectives of the management plan.	Staffing plan implemented that reflects the skills and knowledge base needed to effectively implement the management plan.	Sufficient and appropriate human resource capacity for effective management plan implementation.
OF-2.2.	Ensure staff manage contracts and memorandum of agreements (MOA) that fulfill responsibilities and requirements for products, services and staffing for implementation of the management plan.	Staffing contracts and MOAs effectively implemented in a timely and seamless manner.	
OF-2.3.	Maintain a dynamic internship program, including administration, recruiting, mentoring, and evaluation, to engage university students and build local capacity to support sanctuary programs and activities.	Active internship program.	Well-trained and coordinated staff whose skills and knowledge-base remain current and relevant to the needs of effective sanctuary management.
OF-2.4.	Improve training and team-building opportunities for staff, prioritizing those skills and information/knowledge needs that will best support successful implementation of sanctuary initiatives and programs.	Training plan for each staff member and at least one annual staff retreat.	
OF-2.5.	Update facility safety plans to protect staff and visitors and ensure the protection of sanctuary facilities, vessels and vehicles in daily operation and in the event of disasters. Ensure that all staff are aware of current safety procedures.	Annually updated emergency preparedness and safety plan, including regular safety training and drills.	Trained staff compliant with safety and environmental procedures.
OF-2.6.	Incorporate NOAA environmental compliance directives and local, state and federal environmental regulations into all sanctuary operations.	Compliance with environmental regulations complied.	

Objective OF-3:

Assess, evaluate and maintain facilities and vehicles to meet sanctuary standards and support staff needs to successfully implement programmatic activities.

Activity		Output	Outcome
Place-Based Planning			
OF-3.1.	Update the *Facilities Master Plan for the Office of National Marine Sanctuaries (ONMS) Pacific Region* to reflect current planning efforts, including current assessments and needs for each of the sanctuary facilities.	Updated master plan.	Updated planning framework for facility needs.
OF-3.2.	Continue exploring the development of a discovery center on Kauaʻi to provide offices, meeting space, and expanded facilities for education and outreach.	Opportunities pursued and explored for the development of a discovery center on Kauaʻi.	Opportunities identified for new facilities to support sanctuary operations and outreach.
OF-3.3.	Identify facilities on Hawaiʻi island to provide office space and expanded facilities for education and outreach.	List of potential facilities on Hawaiʻi island.	
OF-3.4.	Identify facilities on the North Shore of Oʻahu to provide education and outreach opportunities adjacent to the sanctuary.	List of potential facilities on the North Shore of Oʻahu.	
OF-3.5.	Develop a schedule and costs for regular building and grounds maintenance for all facilities, especially the NOAA-owned facilities in Kīhei, Maui. Incorporate this into annual operating plans to address maintenance issues in a timely manner and avoid deferred maintenance that could increase future repair costs.	10-year building and grounds maintenance plan and cost schedule, updated annually	Streamlined process to ensure maintenance of sanctuary facilities and vehicles.

Activity	Output	Outcome
Place-Based Planning		
OF-3.6. Implement the *Kīhei Campus Plan* as outlined by the *Master Plan Update Improvements* (2009) and *Visitor Center Exhibits and Campus Master Plan Concept* (2010).	Professionally installed exhibits in and around the visitor center and completed courtyard, outdoor activity areas and landscaping.	Planning and implementation of improvements at the Kīhei campus fully realized.
OF-3.7. Evaluate the effectiveness of flood preparedness efforts at the Kīhei facility and update the *Masonry Building Facility Survey and Flood Mitigation Investigation* (2011) as needed.	Completed assessment of the status of flood protections.	
OF-3.8. Coordinate with ʻAoʻao O Na Loko Iʻa O Maui (Maui Fishpond Association) to restore the Hawaiian fishpond which serves as a natural buffer to reduce flooding, erosion, and sedimentation at the Kīhei facilities.	Ongoing restoration of the fishpond.	
OF-3.9. Assess sanctuary facilities biannually to ensure adequate and safe infrastructure for staff and visitors.	Assessment of facility effectiveness.	Adequate facilities for staff and programs.
Best Management Practices		
OF-3.10. Implement green building standards in renovations to increase energy conservation. At the Kīhei facilities, increase on-site electrical production to achieve a positive energy flow to the grid.	Installed technology to increase energy savings (e.g., battery storage, additional photovoltaic, windmills).	Diverse strategies employed to decrease the environmental impacts of sanctuary operations.
OF-3.11. Reevaluate recycling programs at all offices to maximize recycling of all waste materials that are accepted by local recyclers.	Comprehensive recycling program evaluated at all sanctuary facilities.	
OF-3.12. Utilize the National Park Service Climate Leadership in Parks (CLIP) Tool to measure and strategize to reduce the carbon footprint of the sanctuary.	Plan in place for each sanctuary facility to reduce its carbon footprint.	
OF-3.13. Promote alternative transportation opportunities for staff and visitors to sanctuary facilities.	Alternative transportation used by staff and visitors.	
OF-3.14. Grow native plants in the landscape to minimize water usage, provide shading and act as a natural filtration system; communicate its cultural and conservation value to visitors.	Reduced water usage and green landscaping interpretation.	
OF-3.15. Obtain vehicles that are energy efficient and fulfill the requirements for the supported programs.	Energy-efficient vehicles acquired.	

Objective OF-4:

Maintain an on-water presence in the sanctuary to ensure effective and efficient sanctuary research, monitoring, resource protection and education activities.

Activity		Output	Outcome
Support Management Implementation			
OF-4.1.	Develop and update vessel operation manuals for each small boat that describe its specific operational procedures and guidelines.	Annually updated vessel operations shared with all vessel operators and crew.	Streamlined process to ensure effective and safe use of small boats in sanctuary activities.
OF-4.2.	Maintain regular training and certifications for vessel operators and crewmembers in accordance with the NOAA and Office National Marine Sanctuary (ONMS) Small Boat Program including all safety training.	Updated certifications for all vessel operators and crew.	
OF-4.3.	Acquire, maintain, repair and modify small boats in accordance with NOAA and ONMS Small Boat Program guidelines and support the operations, personnel and maintenance (OPM) requirements for each vessel.	Small boats maintained and operational.	
OF-4.4.	Develop the infrastructure to adequately support the operation of small boats including maintenance and storage facilities, pier space, and trailers and trucks for towing.	Identified maintenance and storage facilities, pier space, trailers and truck for towing for each boat.	
OF-4.5.	Develop and implement procedures and processes to improve the green operation of small boats.	Assessment of all operational procedures to incorporate appropriate green operations.	

Activity	Output	Outcome
Enhance Collaboration		
OF-4.6. Review and update guidance for the use of small boats by partners including an application process, schedule of availability, cost schedule, liability, compatible uses and operational guidelines.	Implemented use policy, formal solicitation process and web-based application to use small boats.	Clear process for partners to use small boats.
OF-4.7. Submit annual ship time requests or acquire the use of other assets to support missions for research, monitoring, mapping and education.	Annual updated list of missions that require ship or aircraft assets.	Increased access to diverse field opportunities to achieve sanctuary goals.
OF-4.8. Coordinate research missions with other supporting entities, such as NOAA Pacific Islands Fisheries Science Center (PIFSC) and academia.	Annual meetings to determine future research missions within the sanctuary.	
OF-4.9. Utilize aircraft and NOAA Unmanned Aircraft Systems (UAS) to support sanctuary missions for research, monitoring, mapping and education.	List of aerial missions updated to support sanctuary programs.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Operational Foundation	(7) Build, maintain, and enhance an operational capability and infrastructure that efficiently and effectively support the attainment of the NMSP's mission and goals.	OF-1.1. Produce an annual operating plan that reflects all sanctuary programmatic efforts for the fiscal year based on the management plan, the budget and resources provided by NOAA, the State of Hawai'i, and other sources.	Every year, the annual operating plan has been updated to reflect the priroties as esyablished in the management plan.
		OF-3.1. Update the Facilities Master Plan for the Office of National Marine Sanctuaries (ONMS) Pacific Region to reflect current planning efforts, including current assessments and needs for each of the sanctuary facilities.	Within 1 year, the *Facilities Master Plan for the Office of National Marine Sanctuaries (ONMS) Pacific Region* has been updated.
		OF-4.3. Acquire, maintain, repair and modify small boats in accordance with NOAA and ONMS Small Boat Program guidelines and support the operations, personnel and maintenance (OPM) requirements for each vessel.	Within 5 years, the small boat requirements for the sanctuary have been reassessed and a plan has been developed to priotitize and fulfill long-term acquisition, maintainence and repair needs for sanctuary vessels.

Ensuring Management Effectiveness

10.5.2. Compliance and Enforcement

He ‘iki ‘ana ia i ka pono.

It is a recognizing of the right thing.

One has seen the right thing to do and has done it.

Desired Outcome

A high level of compliance achieved through the adherence to sanctuary regulations, guidelines, and best practices resulting in increased protection of the marine environment within the sanctuary.

Overview

Enforcement is a critical component of natural resource management in marine sanctuaries and helps to ensure that the natural and cultural marine resources in Hawai‘i are protected. The sanctuary collaborates with enforcement agencies to enforce sanctuary regulations within sanctuary boundaries. The sanctuary currently works with NOAA's Office of Law Enforcement (OLE) and NOAA's General Counsel as the lead offices for enforcement within the sanctuary. The authority for the Hawai‘i Department of Land and Natural Resources Division of Conservation and Resource Enforcement (DOCARE) to enforce federal laws under the National Marine Sanctuaries Act is through the Cooperative Enforcement Agreement and Joint Enforcement Agreement with NOAA. The United States Coast Guard (USCG) also has responsibilities for enforcing sanctuary regulations. In order for there to be better coordination amongst law enforcement agencies responsible for enforcing sanctuary regulations, the *Sanctuary Interagency Law Enforcement Task Force* was formed at the direction of the Office of National Marine Sanctuaries. The task force is made up of the entities that are responsible for enforcing sanctuary regulations in Hawai‘i: NOAA Office of Law Enforcement, NOAA Office of General Counsel, DOCARE, USCG, and sanctuary management.

In addition to law enforcement, the sanctuary promotes voluntary compliance through education programs that encourage responsible marine wildlife viewing, multiple uses of marine resources, and inspired ocean care. This voluntary compliance encourages the public to comply with regulations and guidelines, and practice appropriate behavior to protect marine resources provided they are educated with the proper information. For example, compliance assistance to protect humpback whales promotes behaviors that contribute to boater safety around whales and reduces whale-vessel interactions, while encouraging compliance with the 100-yard humpback whale approach regulation.

The sanctuary office is looking to support community based programs that facilitate community stewardship of marine and coastal resources by supporting education, monitoring and incident reporting in order to achieve better compliance with regulations and promote proper ocean use to protect marine resources. For instance, in Hawai‘i, the Makai Watch program is in place in a number of communities in collaboration with the DLNR Division of Conservation and Resources Enforcement (DOCARE). As of 2014, seven communities have established Makai Watch Programs. At national marine sanctuaries in Florida and California, volunteer based programs called Team OCEAN, short for Ocean Conservation Education Action Network, promote safe and enjoyable use of the marine environment and advocate protection of its natural resources.

Objective CE-1:

Increase coordination and effectiveness of enforcement efforts in order to ensure high levels of compliance with sanctuary regulations and enhance protection of sanctuary resources.

Activity		Output	Outcome
Enhance Collaboration			
CE-1.1.	Continue to facilitate the Sanctuary Interagency Law Enforcement Task Force as a coordinating body for enforcement activities related to sanctuary regulations.	Biannual meetings, attended by representatives from various state and federal agencies.	Continued coordination of various agencies to enforce sanctuary regulations and ensure high levels of compliance.
CE-1.2.	Develop training opportunities for law enforcement professionals to promote and enhance their understanding of the sanctuary's cultural and natural resources and associated regulations.	Training opportunities for members of the enforcement chain (e.g., officers, prosecutors, and judges).	Well-informed enforcement officials leading to increased enforcement of sanctuary regulations.
CE-1.3.	Coordinate with Sanctuary Interagency Law Enforcement Task Force to develop methods to evaluate levels of compliance with regulations, and the effectiveness of its education and outreach efforts.	Assessment of compliance with regulations, and education and outreach efforts.	More effective compliance with regulations.
CE-1.4.	Further define sanctuary enforcement protocols within the NOAA-OLE, DOCARE, and ONMS enforcement program.	Updated local protocol for enforcement efforts.	Continued coordination of various entities to more effectively enforce sanctuary regulations and increase compliance.
CE-1.5.	Coordinate annually with OLE to update the *Joint Enforcement Agreement* between NOAA and the State of Hawai'i to provide input on enforcement requirements within the sanctuary.	Updated enforcement agreements.	
CE-1.6.	Develop and update a memorandum of agreement (MOA) with U.S. Coast Guard to ensure coordinated enforcement efforts.	Updated MOA with USCG.	
CE-1.7.	Consider coordinated enforcement and agreements with other federal resource management agencies that have the capabilities to enforce sanctuary regulations.	Consultations with natural resource management and enforcement agencies.	

Objective CE-2:

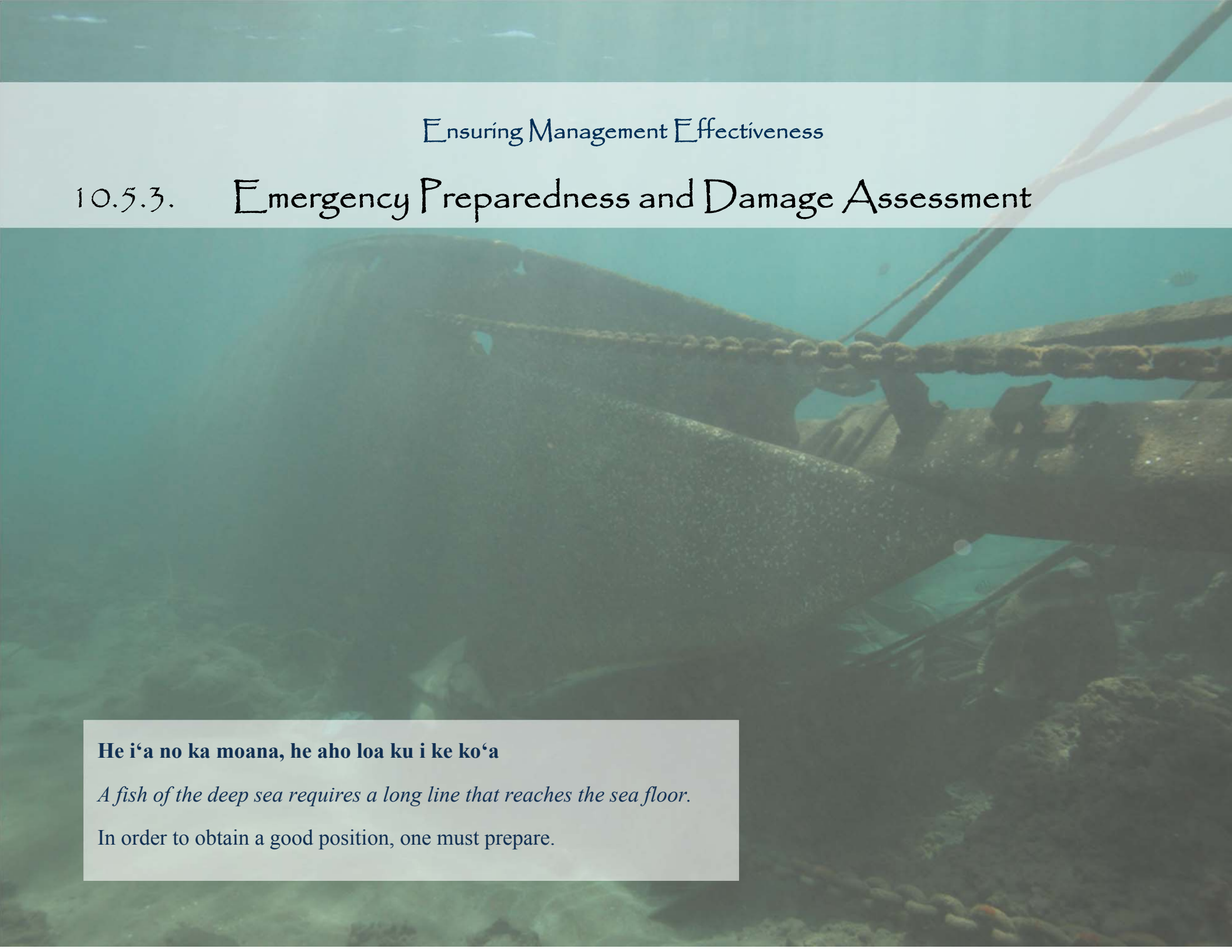
Enhance education and outreach efforts in order to increase public understanding, support and compliance with sanctuary regulations.

Activity		Output	Outcome
Enhance Collaboration			
CE-2.1.	Work with specific user groups that may have impacts on natural and cultural resources within the sanctuary to determine the best means to reach out to their constituencies.	Established communication mechanisms with diverse user groups and constituencies.	Enhanced communication with user groups to enhance voluntary compliance.
Improve Communication			
CE-2.2.	Develop interpretive materials to for sanctuary user groups that promote public awareness and voluntary compliance with sanctuary regulations.	Developed and distributed interpretive materials through various multimedia channels.	Increased public awareness and understanding of impacts on sanctuary resources to enhance voluntary compliance.
CE-2.3.	Continue to assess opportunities for signage describing regulations at access points to the sanctuary, to promote awareness of ocean users of specific resource protection issues and the need for compliance.	Potential signage opportunities identified and prioritized.	
CE-2.4.	Participate in specific ocean related events to educate targeted user groups and encourage voluntary compliance with regulations in order to minimize impacts to natural and cultural resources within the sanctuary.	Sanctuary education materials on regulations and best practices made available at ocean related events (e.g., festivals and conferences).	
Place-Based Planning			
CE-2.5.	Support the development and implementation of community-based marine management programs that aim to strengthen voluntary compliance and improve resources (e.g., Makai Watch Program).	Community place-based planning opportunities identified and supported.	Increased compliance driven by community efforts.
Build Capacity			
CE-2.6.	Coordinate opportunities for volunteers to provide peer-to-peer education and outreach to sanctuary users in high-use or vulnerable areas.	Volunteer-led peer-to-peer outreach and education events.	Increased compliance driven by volunteer efforts.

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Compliance and Enforcement	(5) Facilitate human use in sanctuaries to the extent such uses are compatible with the primary mandate of resource protection, through innovative public participation and interagency cooperative arrangements. (7) Build, maintain, and enhance an operational capability and infrastructure that efficiently and effectively support the attainment of the NMSP's mission and goals.	CE-1.1. Continue to facilitate the Sanctuary Interagency Law Enforcement Task Force as a coordinating body for enforcement activities related to sanctuary regulations.	Twice a year, the Interagency Law Enforcement Task Force has met to assess and evaluate current enforcement needs and responses.
		CE-1.2. Develop training opportunities for law enforcement professionals to promote and enhance their understanding of the sanctuary's cultural and natural resources and associated regulations.	Every year, one training has been offered to law enforcement professionals to familarize them with sanctuary regulations and coordinate on enforcement efforts in the sanctuary.
		CE-2.5. Support the development and implementation of community-based marine management programs that aim to strengthen voluntary compliance and improve resources (e.g., Makai Watch Program).	Within 4 years, community-based programs in two communities have been supported to strengthen voluntary compliance.

10.5.3. Emergency Preparedness and Damage Assessment



He i‘a no ka moana, he aho loa ku i ke ko‘a

A fish of the deep sea requires a long line that reaches the sea floor.

In order to obtain a good position, one must prepare.

Desired Outcome

Increased protection of sanctuary resources from both natural hazards and human-caused incidents or injuries, through coordinated emergency response and damage assessment.

Overview

There are a number of natural and human-caused hazards that can result in potentially harmful impacts to marine resources in the sanctuary. Human-caused incidents include vessel groundings, oil and other hazardous material spills and cargo spills, all of which can have significant impacts on the marine environment. Vessel groundings often occur in Hawai‘i due to the high number of vessels used by the shipping and tourism industries, military, and for recreation and fishing. Groundings can directly damage coral reefs and other habitats. Scattered debris and cargo can pose a threat to navigation that may further damage the reef and harm marine life. Groundings may also result in the release of hazardous material into the marine environment, either suddenly upon grounding, when a vessel breaks apart, or over a prolonged period as it leaks from the grounded or sunken vessel. In addition, vessels carrying oil and other products regularly transit through Hawaiian waters, each with the potential to release hazardous materials into the ocean. Hurricanes, large winter storms, high surf, tsunamis, heavy rains, and landslides are all examples of natural disasters that can have severe impacts to land resources as well as potentially severe impacts to marine resources. Runoff from heavy rains can cause severe erosion and sedimentation that could smother already marginalized coral reefs or nursery and spawning habitats. Storms and tsunamis can also flush man-made materials into the ocean increasing marine debris and hazardous materials that may be a threat to marine life, navigation, and human health and safety.

The numerous vessel groundings that occur in waters surrounding Hawai‘i illustrate the need for contingency plans to be prepared for hazardous materials spills and removal of these vessels to prevent further damage. The State of Hawai‘i and U.S. Coast Guard have only specific responsibilities related to grounded vessels and vessel removal can be delayed if owners lack the necessary resources. The sanctuary will partner with other agencies to develop the necessary emergency response capability, including adequate staff capacity to coordinate and conduct natural and cultural resource damage assessments, support litigation if necessary, and oversee restoration and monitoring actions funded by settlements. Emergency preparedness requires attention to not only specific types of hazards but also to increased preparedness for any type of hazard. A sanctuary-specific *All-Hazard Response Plan* will be developed to complement the *Hawai‘i Area Contingency Plan*, developed by the Hawai‘i Area Committee, and will emphasize how the site will work with other federal and state trustees to protect sanctuary resources during an oil spill or other hazardous incidents.

Objective EP-1:

Improve coordinated emergency response to increase readiness for natural hazards and human caused incidents.

Activity		Output	Outcome
Enhance Collaboration			
EP-1.1.	Continue to participate in the Hawai'i Area Committee and to ensure coordination of sanctuary-specific emergency response planning to natural hazards and human-caused incidents.	Sanctuary input into state emergency planning and response efforts.	Increased coordination in emergency response planning and effectiveness in responding to an incident.
EP-1.2.	Identify and coordinate with other appropriate emergency response experts or agencies to ensure readiness in the case of an emergency response incident.	Effective coordination of response agencies and experts.	
Build Capacity			
EP-1.3.	Identify and assign staff and co-located personnel, in each of the sanctuary offices, to specific responsibilities for resource protection and emergency response.	Resource protection and emergency response responsibilities assigned and evaluated on a regular basis.	Increased staff capacity in emergency response and damage assessment.
EP-1.4.	Acquire and maintain appropriate training and certifications for sanctuary staff for emergency response, including the Incident Command System, Hazardous Waste Operations and Emergency Response (HAZWOPER), Shoreline Cleanup Assessment Technique, Natural Resources Damage Assessment (NRDA), and Aviation Safety.	Emergency response certifications and trainings maintained and kept current.	

Activity		Output	Outcome
Gather Information			
EP-1.5.	Enhance sanctuary website to host key information specific to the sanctuary that can be used to provide up-to-date information to emergency responders.	Web page for sanctuary resource information to be used for emergency response.	Effective use of tools to prepare and respond to emergencies.
EP-1.6.	Coordinate with web-based GIS tools including Pacific Islands Ocean Observing System (PacIOOS) and Environmental Response Management Application (ERMA) to make sanctuary information available including resources at risk, potential high probability threats, maps, coast observation systems, and jurisdictional information.	Sanctuary-specific information available on web-based GIS tools to be used for emergency response planning.	
Enhance Collaboration			
EP-1.7.	Identify gaps in information on key sanctuary resources and develop GIS data that would be useful for emergency responders and resource managers.	Comprehensive GIS data to inform emergency response (e.g., Environmental Sensitivity Index maps, Biogeographic Assessments and updated satellite imagery).	Effective use of data to prepare and respond to emergencies.
EP-1.8.	Develop with partners a sanctuary-specific All-Hazards Response Plan that includes appropriate notifications to various stakeholder groups and preparation response procedures. Practice plan using exercises that include all partners.	*All-Hazards Response Plan.*	Framework to respond to emergencies and hazards.

Objective EP-2:

Prepare for potential impacts from natural hazards and human-use activities to natural and cultural resources within the sanctuary.

Activity		Output	Outcome
Assess Resources			
EP-2.1.	Improve the collection and synthesis of data, so that the distribution and abundance of sensitive species and habitats can inform emergency response and natural resource damage assessment.	Collection and synthesis of data to inform emergency response and damage assessment.	Increased understanding of the spatial distribution of resources and potential threats and hazards used to inform emergency responders about areas of greatest value, sensitivity, and potential exposure to catastrophic events.
EP-2.2.	Identify the potential locations of human-caused threats to sanctuary resources from catastrophic events (e.g., hazardous material spills) using information such as shipping lanes, anchorages, transfer stations, and facility locations.	Place-based information of potential threats integrated into sanctuary emergency planning.	
EP-2.3.	Identify sanctuary and coastal resources that are vulnerable to natural hazards based on existing historical or analytical information (e.g., tsunami inundation, sea-level rise, and flood maps) and create new GIS products to highlight sanctuary resources at risk from natural hazards.	Resource vulnerability to natural hazards integrated into sanctuary emergency planning.	
EP-2.4.	Partner to assess the risk of impacts to marine resources in the sanctuary using the data collected on potential threats from human-caused and natural disasters.	Risk assessment of human and natural hazards for sanctuary emergency planning.	

Objective EP-3:

Participate in the Natural Resource Damage Assessment (NRDA) process with ONMS and the State of Hawai‘i for incidents that injure sanctuary resources.

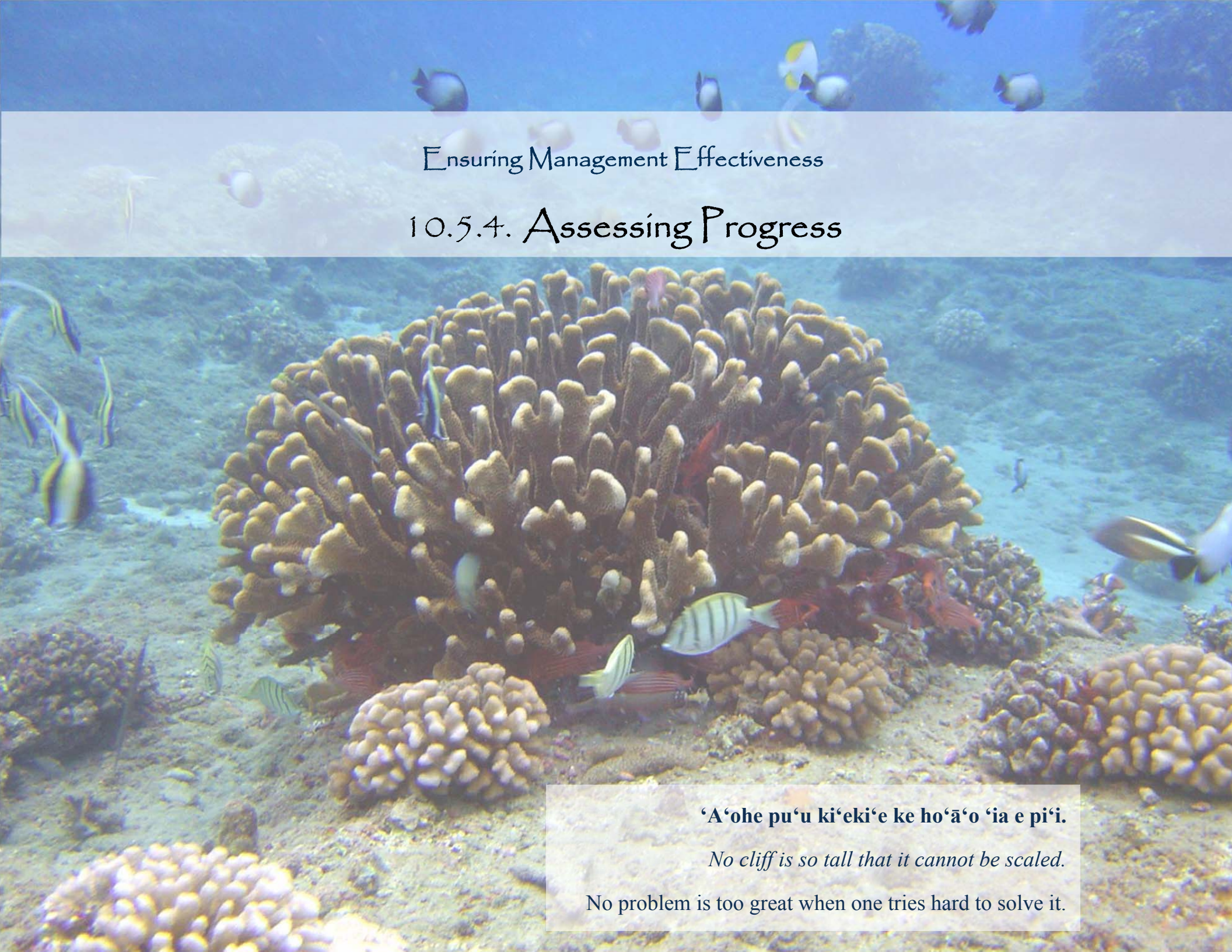
Activity		Output	Outcome
Enhance Collaboration			
EP-3.1.	Work with appropriate NOAA offices, and federal, state and county agencies to assess injury to marine resources in the sanctuary.	Participate in injury assessment of impacted sanctuary resources.	Increased coordination in the assessment of natural resource damage and subsequent restoration efforts.
EP-3.2.	Work with the appropriate NOAA offices and the State of Hawai‘i to implement the National Resource Damage Assessment (NRDA) process to identify how to restore, replace, or acquire the equivalent of the injured sanctuary resources.	Incident-specific plans to restore sanctuary resources.	
EP-3.3.	Collaborate with partners and stakeholders to develop a monitoring program to assess the effectiveness of restoration efforts.	A monitoring program to assess restoration efforts.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Emergency Preparedness and Damage Assessment	(7) Build, maintain, and enhance an operational capability and infrastructure that efficiently and effectively support the attainment of the ONMS's mission and goals.	EP-1.8. Develop with partners a sanctuary-specific All-Hazards Response Plan that includes appropriate notifications to various stakeholder groups and preparation response procedures.	Within 2 years, an All-Hazards Response Plan has been developed and is updated on an annual basis, and response plans are communicated and coordinated amongst partners to enssure readiness to respond to an incident in or adjacent to the sanctuary.
		EP-2.2. Identify the potential locations of human-caused threats to sanctuary resources from catastrophic events (e.g., hazardous material spills) using information such as shipping lanes, anchorages, transfer stations, and facility locations.	Within 5 years, a risk assessment model has been developed for analyzing the potential areas for incidents that could cause a threat to sanctuary resources from natural and human caused hazards.

Ensuring Management Effectiveness

10.5.4. Assessing Progress



ʻAʻohe puʻu kiʻekiʻe ke hoʻāʻo ʻia e piʻi.

No cliff is so tall that it cannot be scaled.

No problem is too great when one tries hard to solve it.

Desired Outcome

A performance evaluation framework to continually gauge the sanctuary's progress in meeting its management goals and objectives.

Overview

The action plans in this management plan describe activities that will be undertaken to achieve the management goals and objectives of the sanctuary. Throughout the management plan, specific performance measures have been identified, along with time-bound targets for achieving these management objectives. Management performance metrics are based on *process indicators* that measure the degree to which management activities are being implemented. Often these metrics are not directly connected to the state of the environment, resources, and human communities, but rather are measuring our success at implementing the action plans within this management plan. However, there is also an increased need to identify *impact indicators***,** which measure changes in ecological or social systems that are a result of implementing the action plans in this management plan. Therefore, the sanctuary will use two levels of evaluation, based on both *process indicators* (performance measures or *did we do what we said we would do in our management plan?*) and *impact indicators* (ecological, cultural, and socioeconomic indicators of change or *what did we achieve as a result of implementing the management plan*?). Both types of indicators will be used to measure progress towards achieving the sanctuary's vision, mission, goals and objectives.

In order to understand management effectiveness relative to the condition of natural, cultural, social and economic resources, managers need to identify indicators or reference points that can be used as a proxy for measuring the overall health of the ecosystem (e.g., coral reefs, top predator species). Subsequently, by establishing target levels or thresholds of change for those indicators (e.g., distribution of healthy coral, population size of top predators), and monitoring change in those indicators, sanctuary managers will assess the effectiveness of current management actions, and the corresponding need for adaptive management. This action plan describes the necessary steps to implement an adaptive management approach that is responsive to the evaluation results and allows for adjustments to management activities in order to improve resource protection when trends (indicators) point to a decline in the resource.

The *Assessing Progress Action Plan* describes activities the sanctuary will undertake to assess the implementation of the activities described in the other action plans found throughout this management plan. The sanctuary is proposing to use performance measures to monitor and evaluate how the implementation of activities in the management plan are contributing to achieving the sanctuary's vision, mission, goals and objectives. This information will be tracked and synthesized in annual accomplishment reports and made available to the public. Sanctuary staff will also monitor the impact that sanctuary activities have towards addressing change within ecological, cultural or social systems within the sanctuary. Sanctuary management actions will be informed by these indicators and adapted as necessary to respond to change.

Related Goals

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.

Objective AP-1:

Ensure robust, results-based implementation of the management plan using *process indicators* as a measure of whether management activities are meeting the natural and cultural resource protection objectives and individual activity outcomes as prescribed in the management plan.

Activity		Output	Outcome
Gather Information			
AP-1.1.	Develop a sanctuary advisory council (council) sub-committee to oversee the development and application of a performance measure evaluation framework.	Council sub-committee on performance measures established and performance measure evaluation framework developed.	Evaluation framework in place to continually assess progress towards implementing activities in the management plan.
AP-1.2.	Use *process indicators* (performance measures) as laid out in this management plan to monitor and evaluate how well staff are implementing the activities in the management plan and achieving the specific stated outcomes as described for each activity in each action plan.	Sanctuary performance plan established and implemented, which includes developing monitoring protocols based on already identified indicators; and the process for evaluating, assessing and communicating results.	Information on progress towards achieving management plan activities compiled, responded to, and communicated on a regular and on-going basis.
AP-1.3.	Programmatic staff (e.g., education, research, science) tracks and assesses progress towards achieving performance measures.	Quarterly compilation of performance measure data and assessment towards meeting objectives of management plan.	
Improve Communication			
AP-1.4.	Complete annual *Accomplishment Reports* and *Condition Reports*, as well as other reporting mechanisms in accordance with the Office of National Marine Sanctuaries (ONMS) evaluation standards.	Contributions made to both site-specific evaluation of successful implementation of the management plan, and to a system-wide evaluation.	Management plan evaluation is transparent and effectively communicated to diverse audiences.
AP-1.5.	Ensure that accomplishment updates are available to diverse audiences on a regular basis including Office of National Marine Sanctuaries, State of Hawai‘i Board of Land and Natural Resources, key stakeholders, interest groups and constituents.	Accomplishment updates incorporated into briefing documents, outreach materials, and on the website.	

Objective AP-2:

Advance the application of *impact indicators* to measure the progress of the sanctuary towards addressing change within ecological, cultural or social systems at two sentinel sites within the sanctuary.

Activity	Output	Outcome
Gather Information		
AP-2.1. Identify existing status of key ecological systems within the sanctuary including their spatial distribution, with special attention to transition zones, stressors affecting existing states, and human use activities that can drive those stressors, in partnership with the Ocean Tipping Points project.	A spatial representation of existing biophysical regimes and stressor impacts for two sentinel sites.	Spatial site characterization and assessment helping to establish a baseline and identify key areas that warrant special management attention.
AP-2.2. Identify ranges of acceptable changes (thresholds) for ecosystems in response to human and natural stressors as applied to two identified sentinel sites.	Impact thresholds identified in relation to the condition of biocultural resources and the impacts of stressors for two sentinel sites.	Articulation of acceptable levels (or thresholds of change) in biocultural systems as a standard for triggering adaptive management (a calculated change in management to specific levels of change).
AP-2.3. Identify indicators and reference points that can be used to monitor and evaluate levels of change to ecosystem services in two sentinel sites.	Indicators used to monitor stress levels in relation to levels associated with thresholds (acceptable levels) of change.	

Objective AP-3:

Develop a framework to support adaptive management actions that can be put in place in a timely and effective manner in response to the results of monitoring *impact indicators*.

Activity		Output	Outcome
Gather Information			
AP-3.1.	Collaborate with the Ocean Tipping Points project to develop a range of possible calculated management responses that could be incrementally implemented in response to early signs of decline or change and/or if threshold-based targets are exceeded.	Matrices of possible management responses to address the incremental approach towards exceeding threshold-based targets.	Adaptive management framework established, including agreed-upon protocols and processes to respond to change.
AP-3.2.	Work with NOAA legal counsel to identify legal mechanisms and/ or policy approaches that could be implemented in a timely manner in response to early signs of decline or change and/or if threshold-based targets are exceeded.	Protocols and processes in place for addressing the need to for implementing adaptive management approaches in a responsive and timely manner.	

Performance Measures

	ONMS Goals	Activities Measured	Performance Measures
Assessing Progress	(7) Build, maintain, and enhance an operational capability and infrastructure that efficiently and effectively support the attainment of the NMSP's mission and goals.	AP-1.2: Programmatic staff (e.g., education, research, science) tracks and assesses progress towards achieving performance measures.	Four times per year, performance measure data has been compiled and assessed.
		AP-2.2: Identify ranges of acceptable changes (thresholds) for ecosystems in response to human and natural stressors as applied to two identified sentinel sites.	Within 2 years, impact thresholds have been identified for two sentinel sites.