He‘eia

National Estuarine Research Reserve

Management Plan 2016-2021

He‘eia National Estuarine Research Reserve
Management Plan
2016–2021

Prepared for:

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He‘eia National Estuarine Research Reserve

Management Plan
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A Traditional and Contemporary Approach

The He‘eia NERR:
An Approach to Integrate Traditional Ahupua‘a practices with the Contemporary NERRS Model to Sustainably Manage an Estuary

This plan for the proposed He‘eia National Estuarine Research Reserve (He‘eia NERR) presents an opportunity to honor the past by using the traditional ecosystem management approach embodied in ahupua‘a principles, integrated with the contemporary principles of the National Estuarine Research Reserve System's (NERRS), to sustainably manage the He‘eia estuary. The NERRS’ vision of resilient estuaries and coastal watersheds where human and natural communities thrive is consistent with the traditional ahupua‘a where man and the environment lived in harmony: the circle of life. Many of the objectives and strategies that have been built into this management plan intentionally create a link between traditional knowledge and practices with contemporary management plans. The unique niche of the He‘eia NERR is this integration of traditional and contemporary strategies to sustainably manage the estuary and optimally the entire ahupua‘a of He‘eia. The He‘eia NERR provides not only a model for future generations in Hawai‘i but as important, is its contributions to the NERRS.

Ahupua‘a: A Traditional Approach

“In the time of ‘Umi, son of the great chief Liloa, the Hawaiian Islands were divided into political regions. The four mokupuni (larger islands) of Kaua‘i, O‘ahu, Maui, and Hawai‘i were divided into moku (districts)” (Kamehameha Schools 1994).

Each district was then divided into smaller self-sustaining communities called ahupua‘a. The ancient ahupua‘a were generally pie-shaped geographic units that often included entire valleys, which ran down between the mountain ridges that served as boundaries between adjoining ahupua‘a, to the outer edge of the reef in the sea. Each ahupua‘a also included a stream that defined the watershed (Figure 0-1). These ahupua‘a varied in size on different islands, from as small as 100 acres to as large as 100,000 acres. The word ahupua‘a is derived from ahu, an altar of stones, upon which was placed an image of the head of a pua‘a (pig). The altars marked the boundaries between each ahupua‘a.

The upland forest was called the wao akua, the realm of the gods. There, the trees and forest were the physical manifestation of the spiritual world, and only a few were permitted to enter wao akua. As the water flowed through the wao akua, it would enter the wao kanaka, or the realm of man. This referred to the area that sustained the agriculture, aquaculture, and other human activities (Stewart 2003). From wao kanaka, the water would flow out to the sea, and in many instances through the loko i‘a (fishpond).

The ahupuaʻa contained nearly all of the resources Hawaiians required for survival. Freshwater resources were managed carefully for drinking, bathing, and irrigation. Wild and cultivated plants provided food, clothing, household goods, canoes, weapons, and countless other useful products.

The ahupuaʻa system was a traditional land management system designed to protect the upland water resources as they flowed to the ocean. The konohiki (overseer, or headman of an ahupuaʻa land division under the chief) managed land use, assisted by luna (supervisors) who were experts in different specialties. For example, the luna wai (water master) was in charge of the water for the loʻi (irrigated terraces), and another luna was in charge of the land boundaries within the ahupuaʻa. Each ahupuaʻa also had its own master fisherman and master farmer. The konohiki would manage the ahupuaʻa through the kapu (taboo) system, which placed restrictions on fishing certain species during specific seasons, on gathering and replacing certain plants, and on many aspects of social interaction, to ensure that the community maintained a sustainable lifestyle in harmony with the resources.

Within the ahupuaʻa, the stream was among the most important natural resources to be managed. The Hawaiian word for fresh water is wai and the Hawaiian word for wealth, abundance, and prosperity is waiwai. Water was considered such a sacred resource that, in ancient times, battles were fought for the right to use streams, and the lives of those who abused this right were sacrificed. People took only what water they needed from the stream and were severely punished if they took more than they needed. In fact, the Hawaiian word for law is kānāwai, meaning the equal sharing of water.

> The ahupuaʻa embodies a unique relationship between the Hawaiian people and land as well as the practical and rational approaches applied to insure the sustainability of the natural environment from overexploitation, pollution and extinction. According to ancient folklore (moʻolelo), the islands and its people were born of the spirit world by gods Papa (the earth) and Wakea (the sky). As such, they share a common origin as living entities. As a living entity, the land is viewed by the Hawaiians as a woman who gave birth to and nurtured the Hawaiian people and whose bosom we will return to upon death. This unique "circle of life" relationship illustrates an inherent symbiotic existence between man and the land. The proverbial Hawaiian saying, "if you care for the land, the land will care for you," typifies this timeless relationship. (Blane and Chung 2000)

The basic principles of the ahupuaʻa are as follows (Blane and Chung 2000):

- Kai Moana: Preserve all life in the ocean extending from the shoreline to the horizon
- Makai: Respect the land and resources extending from the shoreline to the sand's reach
- Mauka: Respect all land and resources from the sand's edge to the highest mountain peak
- Kamolewai: Respect all water resources, including rivers, streams, and springs and life within

- Kanakahonua: Preserve and respect the laws of the land and each other to ensure the community's health, safety, and welfare
- Kalewalani: Respect the elements that float in the sky, including the sun, moon, clouds, stars, wind, and rain, which guide the planting and fishing seasons, provide water, and create the tides and directions for ocean navigation
- Kapahelolona: Preserve the knowledge of practitioners
- Keʻihi: Preserve and respect the sacred elements, including deities, ancestors, the forces of nature, and ceremonial activities

Kumu John Kaʻimikaua (2000) described the weaving of the ʻaha cord as the braiding of these eight principles. Alone, each strand is weak, but together they form a strong rope.

Blane and Chung (2000) assert that ahupuaʻa, in practice, is really about (1) instilling appropriate values that allow people to make the right choices for not only themselves but society; (2) making community-based efforts in which ahupuaʻa tenants, people with localized knowledge, and people with a personal stake in their ahupuaʻa are involved in decision making; (3) creating partnerships and involving stakeholders who, when united, can examine existing western governmental and legal structures and weave the ahupuaʻa principles throughout; and (4) perpetuating this practice from generation to generation.

The National Estuarine Research Reserve System (NERRS): A Contemporary Approach

The NERRS was founded on the principle that long-term protection of representative estuaries provides stable platforms for research and education and the application of management practices that will benefit the Nation's estuaries and coasts. Individual NERRs serve as living laboratories for the study of estuaries and natural and man-made changes. NERRs employ place-based approaches to connect science to people, whether they are teachers, students, decision makers, or coastal residents. It is the integration of locally relevant programs with System-wide approaches that fosters innovation and allows comparison of estuarine conditions across the country. Trusted long-term relationships with local communities, state and federal agencies, and other non-governmental entities form partnerships that amplify the impact of individual NERRs and the system. The influence of NERR programs and products are felt well beyond the boundaries of individual sites.

The NERRS is guided by several principles (NERR Strategic Plan 2011-2016):

- Engage local communities and citizens to improve stewardship of coastal resources;
- Create strong partnerships to enhance the success of Reserve programs;
- Integrate research, education, and stewardship to address complex coastal problems;
- Implement best management practices (BMPs) at reserves to lead by example;

- Seek regional collaborations to extend the influence of reserve programs and products.

The Vision of the NERRS is: Resilient estuaries and coastal watersheds where human and natural communities thrive. The Mission of the NERRS is: To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas.

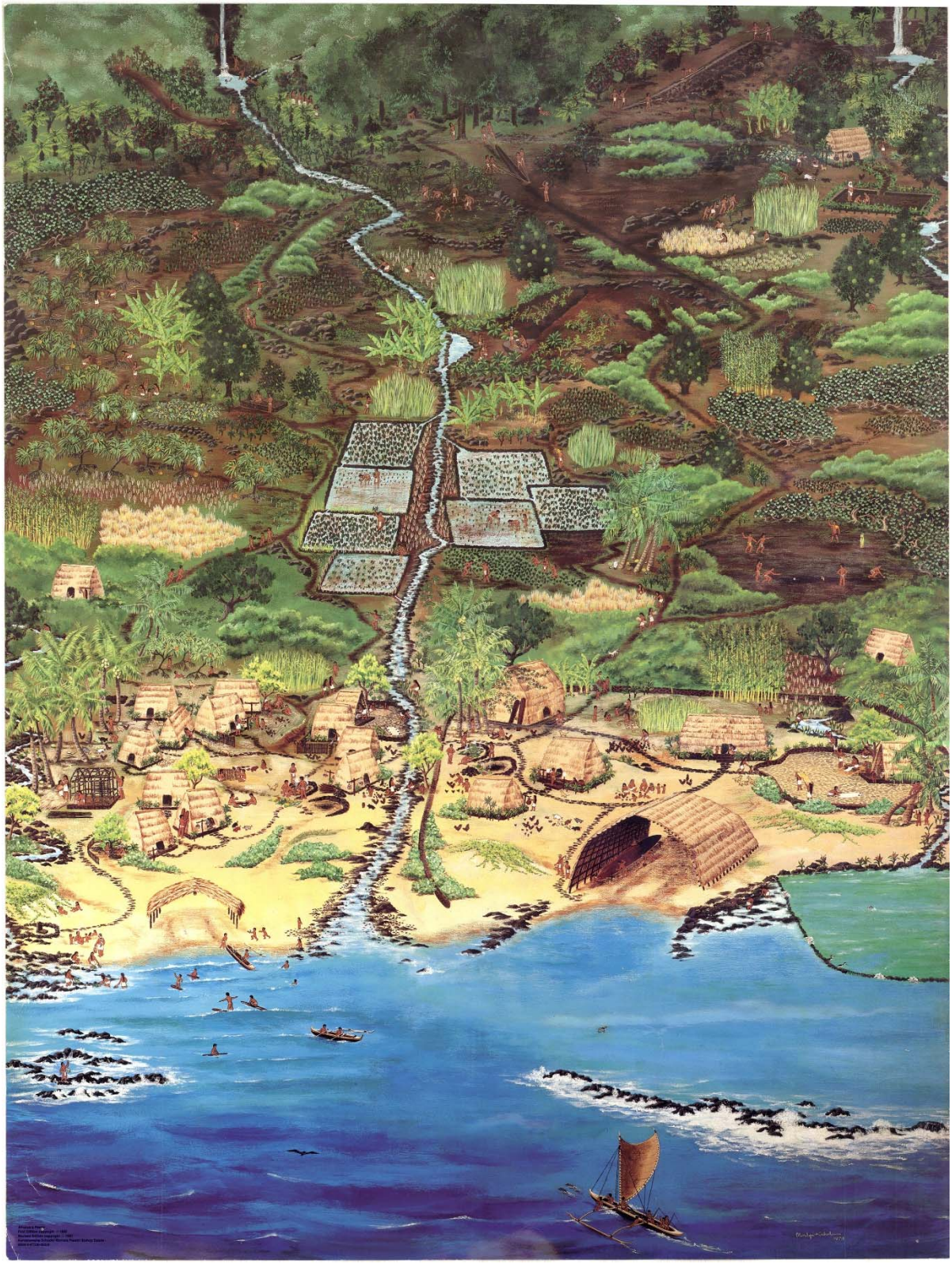

Figure 0-1. The Ahupua‘a – Life in Early Hawai‘i

Artist Marilyn Kahalewai

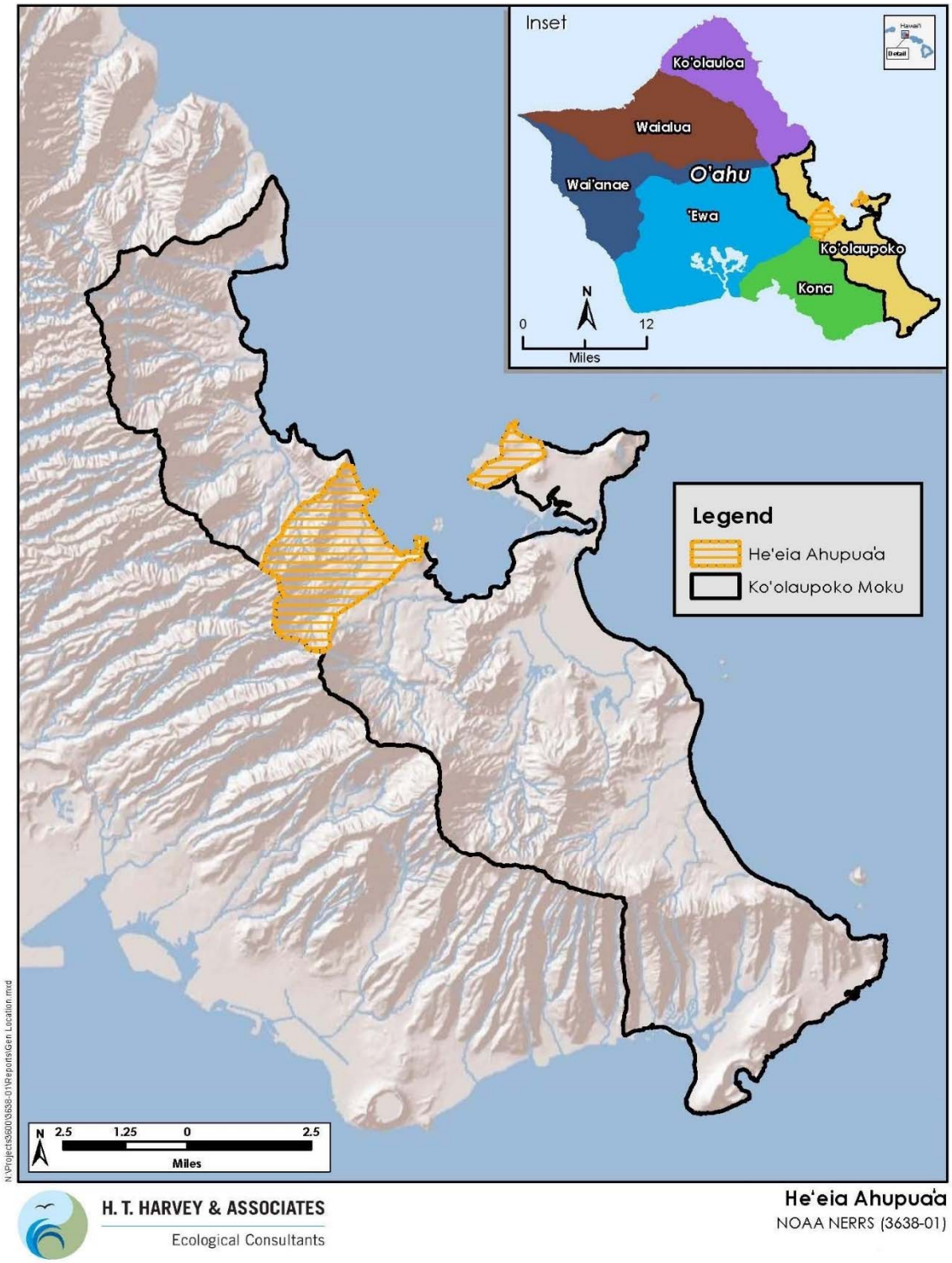

Figure 0-2. The Ahupua‘a of He‘eia, Located in the Ko‘olaupoko Region of O‘ahu

Acknowledgements

First of all, we would like to acknowledge the original stewards, the kūpuna (ancestors) of this land, native Hawaiians, who managed the ʻāina (land) and kai (ocean) resources sustainably through the ahupuaʻa (traditional land stewardship) practices and values.

We would also like to acknowledge the current active stewards of the ʻāina and kai who have been instrumental in pursuing the designation of the Heʻeia estuary as a National Estuarine Research Reserve (NERR). These site partners include the Koʻolaupoko Hawaiian Civic Club, Koʻolau Foundation, Kakoʻo ʻŌiwi, Paepae o Heʻeia, Hawaiʻi Institute for Marine Biology, and the Heʻeia State Park. They unconditionally shared their stories, experiences, and knowledge about the ahupuaʻa of Heʻeia and Kāneʻohe Bay which laid the foundation for the Strategic Plan and management plan. They also provided valuable manaʻo (comments) at the public meetings and on the draft management plan. We are grateful for their time and dedication.

Besides the site partners, there were many other community members who participated in public meetings or provided written comments. We have greatly appreciated the advice, comments, and recommendations provided by our federal partners at the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management Stewardship Division Ecosystem and NERRS Program and the Pacific Islands Region. They attended the numerous public meetings, focus group meetings, and Steering Committee meetings and provided insightful comments to ensure consistency and compliance with the NERRS program.

Finally, it is our kākou (collective) hope that through the implementation of the Heʻeia NERR management plan and commitment by not only the current stewards of the land but the greater community, that the ahupuaʻa of Heʻeia and in particular the Heʻeia estuary will be the ʻāina momona (abundant) legacy for future generations. In the spirit of its legacy, we want to acknowledge the future generations who will continue the stewardship of this ʻāina and kai.

Executive Summary

A Community-Driven Plan

The ahupuaʻa of Heʻeia has a long history of stewardship by Native Hawaiians based upon the traditional ahupuaʻa principles and currently by several of the site partners who have recognized the wisdom and value of the old ways. The community discussed the benefits of greater collaboration and coordination amongst themselves but also the benefit of being part of the larger NERRS. For too long, the site partners struggled independently with limited financial resources and scientific information about the challenges affecting their own geographic areas, including impacts of the overgrowth of mangroves in the Heʻeia fishpond, impacts of upland sedimentation on the stream water quality that nourished the loʻi kalo (taro patches), impacts of the invasive algae on the health of the coral reefs within Kāneʻohe Bay, and ultimate impacts of a rising sea level on Heʻeia State Park.

Through the collective efforts of the site partners and the State of Hawaiʻi, through the Office of Planning (OP), designating the Heʻeia estuary as a NERR was determined to be an appropriate means to address some of their local challenges by partnering with the National Oceanic Atmospheric Administration (NOAA). The Heʻeia NERR was viewed as an opportunity for these site partners to collaborate and constructively coordinate their activities to im prove the entire land and water area associated with the ahupuaʻa of Heʻeia.

The site partners, OP, and NOAA over the last several years have dedicated time and resources to engage the community, balance the impacts of a NERRS designation, and commit to meeting regularly to pursue the NERRS designation process. This management plan reflects not only the site partners' but the larger community's support for a plan to more effectively and efficiently manage the Heʻeia estuary in a culturally appropriate way that builds upon traditional knowledge and contemporary science. The Heʻeia NERR provides an opportunity for coordinated management of resources to collectively achieve not only local goals but the larger goals of NERRS. This Heʻeia NERR management plan[1] starts with "A Traditional and Contemporary Approach," which seeks to integrate traditional knowledge of the ahupuaʻa and contemporary scientific research, monitoring, and training. The placement of the Approach at the beginning of the management plan was deliberate to provide the reader and user of the management plan an understanding and appreciation of the connection between traditional knowledge and contemporary science and research as a model for a sustainable estuary.

[1] In drafting the Heʻeia NERR management plan, the Office of Planning utilized NOAA's 2013 Reserve System Management Plan Guidelines and Resources for guidance. However, there are some very unique features of the Heʻeia NERR that deviate from the standard guidelines, specifically the emphasis on Native Hawaiian Cultural values and practices (as described in the "A Traditional and Contemporary Approach" section) and Community Engagement (see Section 2). It is these unique features that contribute to the Heʻeia NERR's niche within the NERRS.

Management Plan Purpose and Scope

The He‘eia NERR management plan is based on an adaptive management strategy; in other words, as more information becomes available, this management plan may be amended to adapt to the new information through annual and 5-year reviews. The site partners were very deliberate in emphasizing that one of the priority objectives is to develop adequate baseline data; this would include oral and archival information on traditional information when the ahupua‘a of He‘eia and streams were healthy and sustained a productive agricultural and aquacultural environment. The baseline data collection would also include the current conditions of the He‘eia NERR, including water quality, coastal ecosystems, coral habitats, and aquatic species within the streams for both the core and buffer areas. The baseline information will set the foundation upon which to evaluate impacts of human and natural elements, including climate change, and if necessary alter the management objectives and strategies to improve management. Monitoring programs will also provide critical information on impacts of restoration and manipulation activities within and outside the He‘eia NERR.

The adaptive management approach will also assist the He‘eia NERR staff and reserve advisory board (described in Section 5.5.1) to more effectively assess and evaluate staffing, facilities, and program needs. The information gathered will provide the NERRS with critical information related to coastal communities, water quality, and climate change.

Site Nomination Context

The State of Hawai‘i, through OP, has coordinated with NOAA to nominate the He‘eia estuary as a NERR. Since 1972, NOAA has designated 28 NERRs as part of the system. In 1978, Waimanu Valley on the windward coast of Hawai‘i Island was designated as the first NERR in the State of Hawai‘i. However, because of several issues, including the site’s inaccessibility and the lack of a final management plan, the Governor of Hawai‘i requested that the site be de-designated in 1993. Since then, the State has continued to be interested in participating in the NERRS program, because Hawai‘i could benefit from the designation as well as contribute to the NERRS.

Accordingly, on May 21, 2014, Governor Abercrombie officially nominated He‘eia as a NERR to support NOAA’s policy to encourage expansion of the program in unrepresented areas of the country. In particular, the State believes that the designation of He‘eia could contribute to the objectives of the NERRS by addressing the research, education, and natural resource stewardship goals of the system. Unlike the previously designated site in Hawai‘i, He‘eia is easily accessible to researchers, educators, and the public. More importantly, the nomination received the broad-based support of the Native Hawaiian community, represented by the Ko‘olaupoko Hawaiian Civic Club (KHCC) and current managers of the estuary, including Paepae o He‘eia and Kako‘o ‘Ōiwi. Likewise, the University of Hawaii’s (UH) Hawai‘i Institute of Marine Biology (HIMB), located at Moku O Lo‘e, has conducted extensive research in the area and has the management infrastructure to lead the He‘eia NERR, once it is designated.

Site Overview

The He‘eia NERR is located on the northeastern or windward shore of the island of O‘ahu. The site includes He‘eia State Park, He‘eia Fishpond, He‘eia wetlands, a large expanse of marine waters with patch and fringing reefs, as well as Moku o Lo‘e (Coconut Island). The total acreage of the He‘eia NERR is approximately 1,385 acres. The habitat types represented in this He‘eia NERR include both aquatic and terrestrial areas: coral reefs and open marine waters, the enclosed He‘eia Fishpond, mangrove stands, landscaped areas on Moku o Lo‘e and at He‘eia State Park, taro patches and gardens, overgrown wetland marshes, seasonally wet grasslands, and He‘eia Stream.

The State partner for the He‘eia NERR will be UH‘s HIMB. HIMB will work with other landowners and managers, as well as other members of the Reserve Advisory Board (RAB) to coordinate management decisions within the He‘eia NERR.

Coastal Management Issues and Reserve Goals

There are a number of priority coastal management issues for the He‘eia NERR which are consistent with local and national coastal management needs and priorities. These issues include a number of natural processes and anthropogenic effects: invasive species, loss of habitat, erosion and sedimentation, nonpoint source pollution, urbanization and human activities in the area, water quality issues, agricultural development, and climate change impacts on the area. Monitoring the effects of different management strategies on the ecosystem services provided by the areas within the He‘eia NERR will offer insights into adaptive management decisions that will support the health of the ecosystem.

The goals, objectives and strategies in the He‘eia NERR management plan are linked to proposed outcomes that can be used to measure progress or success in accomplishing the objectives. The management plan is specifically designed to bridge the state Coastal Zone Management Ocean Resources Management Plan (ORMP) priorities and NOAA’s mission of science, service, and stewardship with locally relevant issues in He‘eia.

Reserve Niche

From a cultural perspective, the He‘eia NERR provides a unique opportunity to integrate traditional ahupua‘a practices with contemporary scientific research and knowledge to sustainably manage the He‘eia estuary. Historically, the ahupua‘a of He‘eia was managed as a traditional ahupua‘a which nurtured the Native Hawaiian community in abundance while also maintaining a healthy watershed and ecosystem (Blane and Chung 2000).

There are a number of programs and projects already in place in the area that complement the mission of establishing the He‘eia NERR. For example, a number of ongoing research projects are being conducted in the area on critical issues such as invasive species, coral reef resilience to climate change, habitat and water quality, and the effects of traditional agricultural practices on downstream conditions (See Section

4.1 Research and Monitoring Program). Educational activities in the area, including ecotours of Kāneʻohe Bay and hands-on activities at the Fishpond and taro patches, offer visitors an upclose experience of the estuary. Stewardship activities such as the removal of invasive species help to restore the estuary to a natural representative state. The rehabilitation of the historic Heʻeia Fishpond and cultivation of taro and other crops using traditional methods support the use of a traditional land use system.

Further, as part of the NERRS network, the Heʻeia NERR is uniquely situated as the sole representative of the Pacific region, and can contribute to a better understanding of island estuaries and coral reef systems. The need for knowledge is urgent, given that many island communities around the world, including those in the Pacific, are feeling the impacts of climate change intensely and immediately.

Reserve Programs Overview

Research, Education and Stewardship

The three foundational programs of the Heʻeia NERR include research, education, and stewardship. Each of these program goals have incorporated the unique niche of Heʻeia and local and national coastal management issues and goals.

The NERR System-Wide Monitoring Program (SWMP) will provide long-term data useful to the research conducted in the Heʻeia NERR, including water quality, weather, habitat, and land-use data. The priority goal under Research and Monitoring is to promote contemporary research and traditional knowledge to increase our understanding of the effects of human activities and natural events (including climate change) to improve informed decision making affecting the Heʻeia estuary and coastal resources. Considering and incorporating traditional knowledge will help to strengthen the research done in the Heʻeia NERR by considering historical land use and manipulation, and its effects on the estuarine environment including the ecosystem services these activities provide. This goal is consistent with the State's Coastal Zone Management's ORMP Priority 1: "Connecting Land and Sea." The ORMP's priorities are aligned with NOAA's priorities. Additionally the NOAA-funded Science Collaborative competitive grant program integrates science end-users into the research process. Heʻeia NERR staff, supported by HIMB, will support relevant research and ensure researchers are aware of relevant traditional knowledge resources that may complement their research projects. Linking research products to end users is another role the Heʻeia NERR staff will play.

The Heʻeia NERR Education Program will include the hands-on, field-based workshop Teachers on the Estuary (TOTE) program and the K-12 Estuary Education Program (KEEP). HIMB provides a full spectrum of formal and informal educational opportunities for all types of participants along the learning continuum. A central mission is to create pathways to marine science research and management careers for students from Hawaiʻi school systems. Site partners such as Paepae o Heʻeia and Kakoʻo ʻŌiwi each have their own place-based knowledge and ecological-based education programs. The priority goal under the Education

Program is to develop place-based education and training programs for the He‘eia NERR that inspire and educate the community about estuaries, coastal ecosystems, and traditional Hawaiian practices. This is consistent with ORMP Priority 2: “Preserving Our Ocean Heritage.”

The He‘eia NERR Stewardship Program seeks to support activities that involve the community’s active engagement in management of the He‘eia NERR. The priority goal under the Stewardship Program (also referred to as Public Outreach and Resource Management)[2] is to engage the various communities to create opportunities for greater stewardship that sustains cultural, biological, and natural resources. This is consistent with ORMP Priority 3: “Promoting Collaboration and Stewardship.” Encouraging the use of the He‘eia NERR’s monitoring data and research findings, educational products and informational outreach materials is an important step in linking the He‘eia NERR to the land managers, the public, and local decision makers.

He‘eia NERR Administration Plan

Administration of the He‘eia NERR, like other NERR sites, will be accomplished through a federal, state, and local partnership. At the federal level, NOAA may provide funding, based on appropriations, as well as program guidance and oversight. NOAA shall conduct periodic evaluations to ensure implementation of the management plan and consistency with the NERRS goals and objectives. A Memorandum of Understanding (MOU) between HIMB and NOAA establishes the roles and responsibilities of both agencies (Appendix J). In Hawai‘i the state partner shall be the UH ’s HIMB. HIMB will coordinate with site landowners and land managers as well as other state agencies for the day-to-day management of the site. A Multi-Party Governance Charter between HIMB and landowners and partners will establish the roles and responsibilities of these partners (Appendix K).

The He‘eia NERR has facilities that will be made available upon the He‘eia NERR designation for NERR program needs. As the He‘eia NERR develops during its first 5 years of operation, interim facilities will likely need to be improved or expanded to adequately meet growing program needs. Items like dedicated office space, additional storage, expanded laboratory and educational facilities, and increased community meeting space may be needed. However, to a large extent, the addition of any facilities beyond what the current site partners have available will be dependent on the availability of financial resources.

The initial staffing needs will include a full-time Reserve Manager, Education Coordinator, Research Coordinator. The He‘eia NERR management plan also recommends the hiring of a Stewardship Coordinator and Cultural Resource Coordinator since Native Hawaiian values and practices are an integral part of the He‘eia NERR. These staff members will develop and manage NERR programs led by HIMB.

[2] As previously noted in footnote 1, although the He‘eia NERR management plan seeks to be consistent with NOAA’s 2013 guidelines, during the community engagement process (specifically the focus group meetings), the Stewardship Program was referred to as Public Outreach and Resource Management. Thus, the meeting notes contained in Appendices F and G may refer to training aspects or stewardship activities in the He‘eia NERR as Public Outreach and Resource Management, but they are one and the same.

As funding or partnership opportunities become available, there will be additional staff required within the first five years, to meet the management plan goals and objectives. The staffing positions could be full-time, part time, or internships with capacities or expertise in the following areas: outreach or stewardship coordinator, training coordinator, research assistant, technical positions to implement and monitor the NERR SWMP, and technical assistant.

He‘eia NERR Land Acquisition

Currently, the He‘eia NERR contains only the makai or lowland portions of the ahupua‘a of He‘eia which met the site selection criteria established by OP and NOAA. The site selection criteria includes having the support of the landowner for its inclusion in the He‘eia NERR, having adequate state control over the property, and being a good representative estuarine ecosystem suitable for long-term estuarine research, education and interpretive efforts. One of the long-term visions of the community is to expand the boundaries to include more of the mauka or upland areas of the watershed. Another possible expansion for the He‘eia NERR is the forested area above He‘eia Kea Small Boat Harbor.

He‘eia NERR Resource Manipulation and Restoration Activities

The Resource Manipulation section (Section 10) describes activities such as agriculture and aquaculture. One of the primary goals of the site partners through the He‘eia NERR is for the ahupua‘a of He‘eia to be restored and managed as a traditional ahupua‘a with functioning agricultural and aquacultural systems. The current resource manipulation activities being conducted in the He‘eia NERR buffer area include the conversion of currently fallow lands in the He‘eia wetlands into a working agricultural landscape with organic lo‘i kalo and organic dryland agricultural crops and aquaculture activities in He‘eia Fishpond.

The He‘eia NERR management plan includes a description of the current resource restoration activities conducted by site partners and government agencies. The Resource Restoration section (Section 11) outlines the current restoration activities conducted in the He‘eia NERR buffer areas including invasive species removal in the wetlands and along He‘eia stream conducted by Kako‘o ‘Ōiwi, invasive seaweed removal by Paepae o He‘eia, and coral reef restoration conducted by the Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR).

Protection and Preservation of Valued Cultural, Historical, and Natural Resources, Including Native Hawaiian Traditional and Customary Rights

The State of Hawai‘i has a constitutional obligation to preserve and protect, to the extent feasible, traditional and customary rights exercised by Native Hawaiians. The State recognizes that the ahupua‘a of He‘eia is a living resource where Native Hawaiians exercise traditional and customary practices, either within the He‘eia NERR or within the ahupua‘a of He‘eia, to which the He‘eia NERR may provide access. With this recognition comes the obligation to preserve and protect those constitutionally guaranteed rights. The Hawai‘i Supreme Court, in its decision in Ka Pa‘akai O Ka ‘Āina v. Land Use Commission, 94 Hawai‘i 31, 7 P.3d 1068 (2000), provides government agencies an analytical framework to ensure the protection

and preservation of valued cultural, historical, and natural resources. This management plan addresses this requirement as follows:

1. The management plan identifies the valued cultural, historical, and natural resources on the He‘eia NERR site. Section 1 provides an archival review of the available biological and ecological documentation, research, cultural impact assessments, and archaeological reports of the area.

2. The management plan describes threats and impacts to these valued cultural, historical, and natural resources on the He‘eia NERR site. Generally, threats consist of the impacts on the free flow of He‘eia Stream caused by overgrowth of vegetation, adverse effects on endangered waterbirds resulting from the proliferation of mangroves, and impacts on downstream water quality caused by runoff from uplands.

3. The third step in the Ka Pa‘akai analysis is the “feasible actions” or in this case the management plan sets forth the management goals, objectives, and strategies to be taken by the He‘eia NERR administrators and site partners to reasonably protect these valued resources or access to these resources. The management actions, developed through the community engagement process, seek to integrate the traditional land stewardship principles of the ahupua‘a and contemporary scientific research and investigation.

In developing the He‘eia NERR management plan, the State accepted the kuleana (responsibility) of developing a management plan that was: (1) based on community engagement, (2) built on the extensive archival studies and research previously conducted in the area, and (3) proposes reasonable management objectives. Throughout the community engagement process, it was apparent that the community stakeholders have been diligently stewarding their lands, managing their resources, and building a wealth of information, but these activities could be strengthened with additional communication and collaboration with other stakeholders. The He‘eia NERR provides an opportunity not only to weave together the cultural and ecological perspectives but also to support a kākou (collective) effort to share information, maximize limited resources, and manage the entire He‘eia estuary in a sustainable way.

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Figures

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Kāko‘o ‘Ōiwi
Ko‘olaupoko Hawaiian Civic Club
Paepae o He‘eia
Source for maps in the documents include Hawai‘i Office of Planning, State GIS Website, and conservation plans produced by Townscape (2011a and b).

Acronyms and Other Abbreviations

Abbreviation	Meaning
BMPs	best management practices
CDD	Community Development District
CFR	Code of Federal Regulations
CIA	cultural impact assessment
CRAMP	Coral Reef Assessment and Monitoring Program
CWA	Clean Water Act
CWB	Clean Water Branch, DOH
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DAR	Division of Aquatic Resources, DLNR
DBEDT	Hawai‘i State Department of Business, Economic Development and Tourism
DHHL	Department of Hawaiian Homelands
DLNR	Hawai‘i State Department of Land and Natural Resources
DOBOR	Division of Boating and Ocean Recreation, DLNR
DOCARE	Division of Conservation and Resource Enforcement, DLNR
DOFAW	Division of Forestry and Wildlife, DLNR
DPP	Department of Planning and Permitting
EA	environmental assessment
EBM	ecosystem-based management
EIS	environmental impact statement
EMD	Environmental Management Division
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GIS	Geographic Information Systems
HAR	Hawai‘i Administrative Rules
HCDA	Hawai‘i Community Development Authority
HEPA	Hawai‘i Environmental Policy Act
HIDOH	Hawai‘i Department of Health
HIMB	Hawai‘i Institute of Marine Biology

HPD	Honolulu Police Department
HRS	Hawai‘i Revised Statutes
ICI	invertebrate community index
KEEP	K-12 Estuarine Education Program
KMWP	Ko‘olau Mountains Watershed Partnership
KHCC	Ko‘olaupoko Hawaiian Civic Club
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve
NERRS	National Estuarine Research Reserve System
NH3	ammonia-nitrogen
NMFS	National Marine Fisheries Service
NO_3+NO_2	nitrate+nitrite-nitrogen
NOAA	National Oceanic and Atmospheric Administration
NOP	National Ocean Policy
NPO	National Priority Objectives
NSF	National Science Foundation
NWI	National Wetland Inventory
MOU	Memorandum of Understanding
OCCL	Office of Conservation and Coastal Lands, DLNR
OP	Office of Planning, State of Hawai‘i
ORMP	Ocean Resources Management Plan
PRCP	Polluted Runoff Control Program
RAB	Reserve Advisory Board
SEC	Site Evaluation Committee
SES	Social-Ecological System
SHPD	Hawai‘i State Historic Preservation Division, DLNR
SMA	Special Management Area
SOEST	School of Ocean and Earth Science and Technology
SSC	Site Selection Committee
TCP	Traditional Cultural Properties
TMDLs	total maximum daily loads
TMK	Tax Map Key (Number to identify real property unit)
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids

UH	University of Hawai‘i
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
ZCTA	Zip Code Tabulation Area (U.S. Census equivalent of Zip Code area)

Glossary of Hawaiian Words

The Hawaiian translations are from Pukui and Elbert (1986). For some of the words a more contemporary meaning may be used by Hawaiians today; for these words they are placed before the Pukui and Elbert (1986) translations and marked with "(common)."

The ʻokina and the kahakō are diacritical markings that are part of the Hawaiian alphabet and used in the Hawaiian words. The ʻokina, or glottal stop, is found only between two vowels or at the beginning of a word that starts with a vowel. A break in speech is created between the sounds of the two vowels. The pronunciation of the ʻokina in the word Kākoʻo is similar to saying "ka-koh-oh." The kahakō is found only above a vowel. It stresses or elongates a vowel sound from one beat to two beats. The kahakō is written as a line above a vowel. There are differing pronunciations of some words depending on the area or island.

Hawaiian Word	English Translation
ʻaha moku	A system of best practices based on indigenous resource management practices within specific moku (district) boundaries to sustain resources and the community of that moku. A series of district councils that would manage land and natural resources for tenants and the community through the implementation of site specific cultural conservation coupled by utilitarian practices.
ahu	Altar of stones (common).
ahupuaʻa	Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (ahu) of stones surmounted by an image of a pig (puaʻa), or because a pig or other tribute was laid on the altar as tax to the chief.
ʻāina	Land.
aliʻi	Chief, chiefess, officer, ruler, monarch, peer, headman, noble, aristocrat, king, queen, commander.
ʻamaʻama	Mullet (*Mugil cephalus*), a very choice indigenous fish.
ʻāpana	Piece, slice, portion, fragment, section, segment, installation, part, land parcel, lot, district, sector, ward, precinct.
ʻaumakua	Family of personal gods, deified ancestors who might assume the shape of sharks, owls, hawks [etc.]. A symbiotic relationship existed; mortals did not harm or eat ʻaumakua, and ʻaumakua warned and reprimanded mortals in dreams, visions, and calls. Aumākua—plural of ʻaumakua.
ʻauwai	Ditch, canal, water conveyance channels.
ʻawa	Kava (*Piper methysticum*).
awa	Milkfish (*Chanos chanos*).
haʻahaʻa	Humility (common).
hala	Pandanus or screw pine (*Pandanus odoratissimus*).
haku	Ambassador(s) (common).
hālau	Meeting house.
hau	Lowland tree (*Hibiscus tiliaceus*), found in many warm countries, some spreading horizontally over the ground forming impenetrable thickets, and some trained on trellises.

Hawaiian Word	English Translation
heiau	Pre-Christian place of worship, shrine; some heiau were elaborately constructed stone platforms, others simple earth terraces. Many are preserved today.
hīhīmanu	Various stingrays (Dasyatidae) and eagle rays (*Actobatus narinari*).
ʻili	Land section, next in importance to an ahupuaʻa and usually a subdivision of an ahupuaʻa.
imu	Underground oven.
iwi kūpuna	Ancestral bone remains (common).
kākou	Collective.
kahu	Honored attendant, guardian, nurse, keeper of ʻunihipili [spirit of a dead person] bones, regent, keeper, administrator, warden, caretaker, master, mistress.
kahuna	Priest, sorcerer, magician, wizard, minister, expert in any profession. Kāhuna—plural of kahuna.
kai	Ocean.
kākou	Collective. We (inclusive, three or more).
kalo	Taro (*Colocasia esculenta*), a kind of aroid cultivated since ancient times for food, spreading widely from the tropics of the Old World. In Hawaiʻi, taro has been the staple from earliest times to the present, and here its culture developed greatly, including more than 300 forms.
kamaʻāina	Native-born, one born in a place, host; native plant; acquainted, familiar, and child.
kānāwai	Equal sharing of water (common).
kapu	Taboo.
kiaʻi	Guardian, watchman, caretaker.
koʻa	Fishing shrine (common).
koko	Blood.
konohiki	Overseer, headman of an ahupuaʻa land division under the chief; land or fishing rights under control of the konohiki.
kuapā	Wall of a fish pond.
kuāuna	Taro patch walls (common). Bank or border of a taro patch; stream bank.
kula	Plain, field, open country, pasture. An act of 1884 distinguished dry or kula land from wet or taro land.
kuleana	Native Hawaiian land rights (common). Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province.
kupuna, kūpuna	Elders (common). Grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle. Kūpuna—plural of kupuna.
lūʻau	Hawaiian feast.
lei niho palaoa	Ivory pendant, originally probably whale's tooth, rarely of stone or wood, later also of walrus tusk; necklace of beads of whale's teeth. Lit. ivory lei.
leina	Place to leap from.
leina ʻuhane	Leap of the soul; a place where the souls of the dead leaped into the nether world.
limu	Seaweed, algae (common)
loʻi	Irrigated terrace, especially for taro, but also for rice; paddy.
loʻi kalo	Irrigated taro patch.
loko iʻa	Fishpond (common).
lomi	Knead, massage, rub out.
lūʻau	Hawaiian feast.
luna	Supervisor.
luna wai	Water master.

Hawaiian Word	English Translation
mahalo	Gratitude. Respects.
mahele	Land division.
maiʻa	All kinds of bananas and plantains.
mākāhā	Sluice gate, as of a fish pond.
makai	Toward the sea.
makani	Wind.
māla	Garden, cultivated field.
mālama	To take care of, care for, preserve, custodian, caretaker.
malihini	Foreigner, newcomer.
manaʻo	Thought, opinion.
mauka	Toward the mountain.
moku	District, island, islet, section.
mōʻī	King, sovereign, monarch, majesty, ruler, queen.
momona	Abundant.
moʻo	Lizard, water spirit; narrow strip of land.
moʻolelo	Story, tale, myth, history, tradition, literature, legend, journal, log, yarn, fable, essay, chronicle, record, article; minutes, as of a meeting. (From moʻo ʻōlelo, succession of talk; all stories were oral, not written).
niho	Wall foundation (common). Stones set interlocking, as in a wall.
noʻonoʻo	Thoughtful.
ʻōlelo noʻeau	Proverb, wise saying, traditional saying.
oli	Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill at the end of each phrase; to chant thus.
olonā	A native shrub (*Touchardia latifolia*).
ʻōpala	Trash.
pali	Cliff, precipice, steep hill or slope.
pihi	Fish.
pōhaku pele	Volcanic rock (common).
poi	The Hawaiian staff of life, made from cooked taro corms, or rarely breadfruit, pounded and thinned with water.
pono	Propriety (common). Moral, fitting, proper, righteous, right, upright, just, virtuous, fair, beneficial, successful, in perfect order, accurate, correct, eased, relieved.
puʻu	Any kind of protuberance from a pimple to a hill: hill, peak, cone, hump, mound, bulge, heap, pile, portion, bulk, mass, quantity, clot, bunch, knob.
puaʻa	Pig.
puhi	Eel.
pule	Prayer.
ʻuala	Sweet potato (*Ipomoea batatas*).
uhi	Yam (*Dioscorea alata*).
wahi pana	Storied place (common). Legendary place.
wai	Fresh water (common).
waiwai	Wealth, abundance, prosperity.
wao akua	The realm of gods (common). A distant mountain region, believed inhabited only by spirits (akua).
wao kanaka	The real of man (common). An inland region where people may live or occasionally frequent.
wauke	Paper mulberry (*Broussonetia papyrifera*).

Common and Scientific Names for Plants and Animals Mentioned by Community Participants

Common Names		Possible Scientific Names		Source
Hawaiian	Other	Genus	Species	
ʻaʻama	crab	*Grapsus*	*grapsus*	Pukui and Elbert 1986
āholehole	juvenile āhole (Hawaiian flagtail)	*Kuhlia*	*xenura*	Hoover 1993
ʻamaʻama	striped mullet	*Mugil*	*cephalus*	Hoover 1993
awa	milkfish	*Chanos*	*chanos*	Hoover 1993
haole (kūhonu)	white crab	*Portunus*	*sanguinolentus*	Pukui and Elbert 1986
hau	beach hibiscus	*Hibiscus*	*tiliaceus*	Wagner et al. 1999
kalo	taro	*Colocasia*	*esculenta*	Wagner et al. 1999
kūhonu	crab	*Portunus*	*sanguinolentus*	Pukui and Elbert 1986
limu ʻeleʻele	seaweed, algae	*Entermorpha*	*prolifera*	Abbott and Williamson 1974
limu huluhuluwaena	seaweed, algae	*Grateloupia*	*filicina*	Abbott and Williamson 1974
limu kohu	seaweed, algae	*Asparagopsis*	*taxiformis*	Abbott and Williamson 1974
limu manauea	seaweed, algae, ogo	*Gracilaria*	*coronopifolia*	Abbott and Williamson 1974
māmaki	an endemic nettle	*Pipturus*	spp.*	Wagner et al. 1999
manini	convict tang	*Acanthurus*	*triostegus*	Hoover 1993
ʻōʻio	bonefish	*Albula*	spp.*	Hoover 1993
ʻōlena	turmeric	*Curcuma*	*domestica*	Pukui and Elbert 1986
ʻōpae lōlō	brackish-water shrimp or prawn	*Penaeus*	*marginatus*	Pukui and Elbert 1986
weke	goatfish	*Mulloidichthys*	spp.*	Hoover 1993

* spp. = multiple species

Section 1. Introduction

1.1 Introduction to the National Estuarine Research Reserve System

The National Estuarine Research Reserve System (NERRS) was created by the Coastal Zone Management Act (CZMA) of 1972, as amended, to augment the National Coastal Zone Management Program, which is dedicated to comprehensive, sustainable management of the nation's coasts.

The Reserve System is a network of protected areas representative of the various biogeographic regions and estuarine types in the United States. Reserves are established for long-term research, education, and interpretation to promote informed management of the nation's estuaries and coastal habitats. (Title 15, Code of Federal Regulations (CFR), Part 921.1(a)) (Appendix A). The Reserve System currently consists of 28 reserves in 23 states and territories, protecting over 1 million acres of estuarine lands and waters (Figure 1-1).

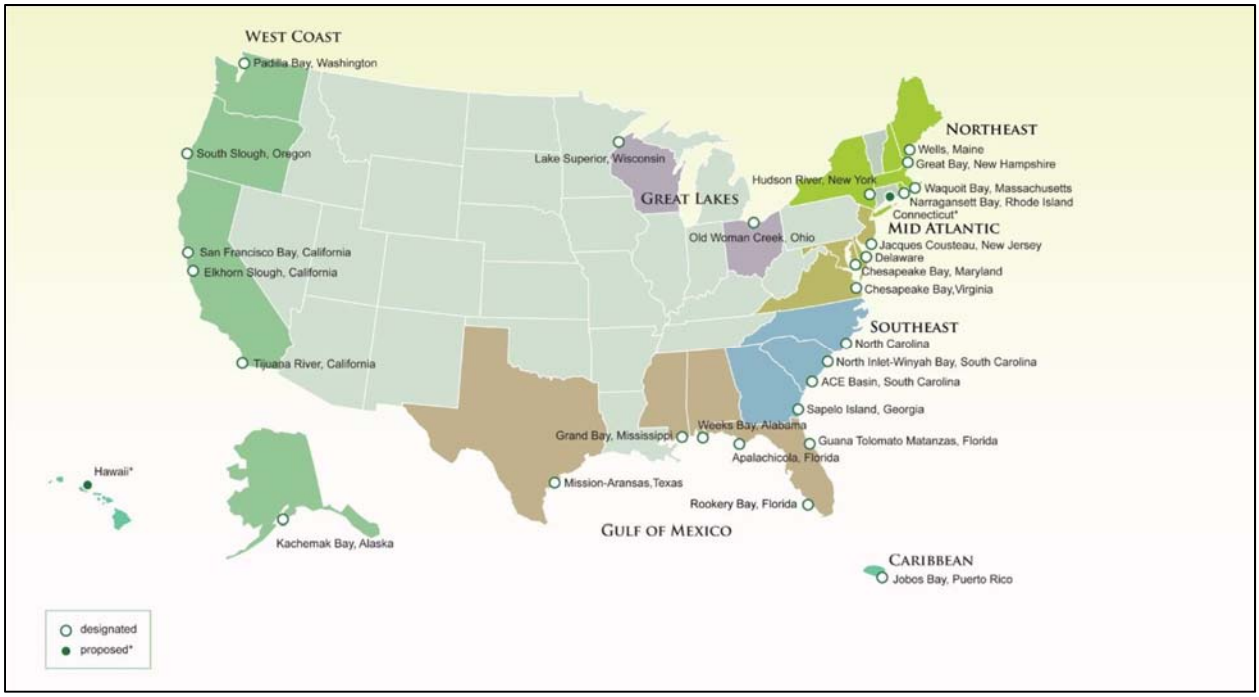

Figure 1.1. National Estuarine Research Reserve System

The Reserve System is a partnership program between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. NOAA provides funding, national guidance, and technical assistance. The state partner manages reserve resources on a daily basis, working collaboratively with local and regional partners.

1.1.1 National Estuarine Research Reserve System Strategic Goals

Estuaries are biologically rich, economically valuable, and highly vulnerable ecosystems. The vision and mission of the reserve system reflect the importance of these systems within our communities.

- **Vision**: Resilient estuaries and coastal watersheds where human and natural communities thrive.
- **Mission**: To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas.

The program goals, per federal regulations (15 CFR 921.1(b)), outline five specific goals for the reserve system:

1. Ensure a stable environment for research through long-term protection of National Estuarine Research Reserve System resources;
2. Address coastal management issues identified as significant through coordinated estuarine research within the system;
3. Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
4. Promote federal, state, public, and private use of one or more reserves within the system when such entities conduct estuarine research; and
5. Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

These foundational goals are complemented by those that are systematically set by the program every 5 years. Strategic planning has been an integral part of the NERRS for nearly twenty years. The planning process is designed to bridge national program direction with local coastal management needs through a representative and participatory process that supports NOAA's mission of science, service, and stewardship. The *2011–2016 Reserve System Strategic Plan* focuses reserve core strengths of research, education, and training on three core issues: climate change, habitat protection, and water quality. The Reserve System Strategic Plan goals are:

1. **Protected Places**: Estuaries and coastal watersheds are better protected and managed by implementing place-based approaches at reserves.
2. **Science**: NERRS scientific investigations improve understanding and inform decisions affecting estuaries and coastal watersheds.
3. **People**: NERRS education and training increases participants' environmental literacy and ability to make science-based decisions related to estuaries and coastal watersheds.

1.1.2 Biogeographic Regions and Boundaries of the National Estuarine Research Reserve System

NOAA has identified 11 distinct biogeographic regions and 29 subregions in the United States, each of which contains several types of estuarine ecosystems (15 CFR 921, Appendix 1). When complete, the reserve system will contain examples of estuarine hydrologic and biological type characteristic of each biogeographic region. As of 2016, the reserve system included 28 reserves with two states in the process of designating a reserve.

Reserve boundary size will vary greatly depending on the nature of the ecosystem. Boundaries must include an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Reserve boundaries encompass areas for which adequate state control has or will be established by the managing entity over human activities occurring within the reserve. Reserve boundaries include a "core" area which comprises key land and water encompassing resources representative of the total ecosystem, which if compromised could endanger the research objectives of the reserve, as well as a "buffer" area designed to protect the core area and provide additional protection for estuarine-dependent species, including those that are rare or endangered. Buffer areas may also include areas necessary for facilities required for research and interpretation. Additionally, buffer areas are identified to accommodate a shift of the core area as a result of biological, ecological, or geomorphological change which reasonably could be expected to occur. (15 CFR 921.11 (c)(3)).

1.1.3 National Estuarine Research Reserve Administrative Framework

The process for federal designation of a NERR has many steps and involves many individuals and organizations. While each reserve is a partnership program between NOAA and a coastal state, there are many entities that collaborate to support designation of a reserve. Other partners include federal and state agencies, nonprofit groups, universities, and members of the local community. For more information on the designation process see http://nerrs.noaa.gov/about/designation-process.html.

Upon designation, the reserve implements the approved reserve management plan and NOAA may provide funding, based on appropriations. A reserve may apply to NOAA for funds to help support implementation of the management plan by funding operations, research, monitoring, education/interpretation, training, stewardship, development projects, facility construction, and land acquisition. Management plans provide a vision and framework to guide reserve activities during a 5-year period and enable the reserves and NOAA to track progress and realize opportunities for growth. Each management plan contains the reserve goals, objectives, and strategies, supported by programs focused on research and monitoring, education and outreach, training, and stewardship. The plan also outlines administration, public access, land acquisition, and facility plans and needs, as well as restoration and resource manipulation plans, if applicable. Reserves are increasingly confronted with complex questions regarding new uses in or near reserves that may or may not be compatible with the reserve system's mission. A thoughtful and comprehensive management plan

provides a foundation for addressing these challenges to protect and manage reserve resources wisely and ensure that the public and coastal decision makers value and protect coastal resources.

NOAA administers the Reserve System and establishes standards for designating and operating reserves, provides support for reserve operations and system-wide programming, undertakes projects that benefit the reserve system, and integrates information from individual reserves and programs to support decision-making at the national level. Additionally, NOAA periodically evaluates reserves for compliance with federal requirements and with the individual reserve's federally approved management plan, as mandated under Section 312 of CZMA (15 CFR 921.40).

NOAA currently provides leadership and support for three system-wide programs: the System-Wide Monitoring Program, the K-12 Estuarine Education Program, and the Teachers on the Estuary (TOTE), as well as the NERRS Science Collaborative. It also provides support for initiatives focused on the reserve system's priorities: climate change, water quality, and habitat protection.

1.2 He'eia National Estuarine Research Reserve (NERR)

1.2.1 History of Reserve Designation in Hawai'i

The insular biogeographic region in the United States is not yet represented in the NERRS. This region comprises three subregions: the Hawaiian Islands, the Western Pacific Islands, and the Eastern Pacific Islands. With the designation of a NERR in Hawai'i, the system will have a tenth region (of 11 total regions) and a twenty-first subregion (of 29 total subregions) represented.

In 1978, a NERR was designated in Hawai'i, in the Waimanu Valley on the windward coast of the Island of Hawai'i. The NERR was administered by the Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW). Waimanu is a remote drowned river valley, accessible only by boat, helicopter, or a strenuous hike on a 9-mile switchback trail. This inaccessibility was one of the reasons the Governor of Hawai'i requested withdrawal of designation of this site in 1993 (PBR Hawai'i 2014). However, interests about establishing a NERR in Hawai'i continued, especially for He'eia.

Governor Neil Abercrombie submitted a letter of interest in July 2012 to propose an expansion of the NERRS to include the unrepresented insular paleotropical region. He designated the Office of Planning (OP) as the lead agency for the site selection process. The Coastal Zone Management (CZM) Program, under the OP, restarted the NERR site selection process for Hawai'i in February 2013. In his letter, the Governor identified the University of Hawai'i as a potential partner.

Phase I of the site selection process involved developing site selection criteria, forming a Site Selection Committee (SSC) to approve the criteria, forming a Site Evaluation Committee (SEC) to perform a technical review of proposed NERR sites, and soliciting proposals from the public (Figure 1-2). OP received

inquiries from all four counties but proposals were received from only two sites: He‘eia in Kāne‘ohe Bay on O‘ahu and Hilo Bay on Hawai‘i Island (PBR Hawai‘i 2014).

In Phase II, the SSC reviewed these two site proposals and was given all available information to consider. The committee selected He‘eia as the preferred site. The site nomination document, including comments received from the public, was forwarded to the Governor in the first quarter of 2014. This document highlighted the fact that in spite of being highly altered by human influence, the He‘eia site is representative of the state and region, and research conducted here is expected to have applications useful for other sites across the state. This site is also easily accessible for researchers, education groups, and the public. Current activities in He‘eia are compatible with existing management plans such as the *Hawai‘i Ocean Resources Management Plan* (OP 2013) and the *Kāne‘ohe Bay Master Plan* (OP 1992), and were considered in the development of this He‘eia NERR management plan. The site also offers excellent opportunities for expanded educational and interpretive activities with easy access for students, local residents, and tourists.

This management plan was developed consistent with NOAA’s Environmental Impact Statement (EIS) development during Phase III of the site designation process.

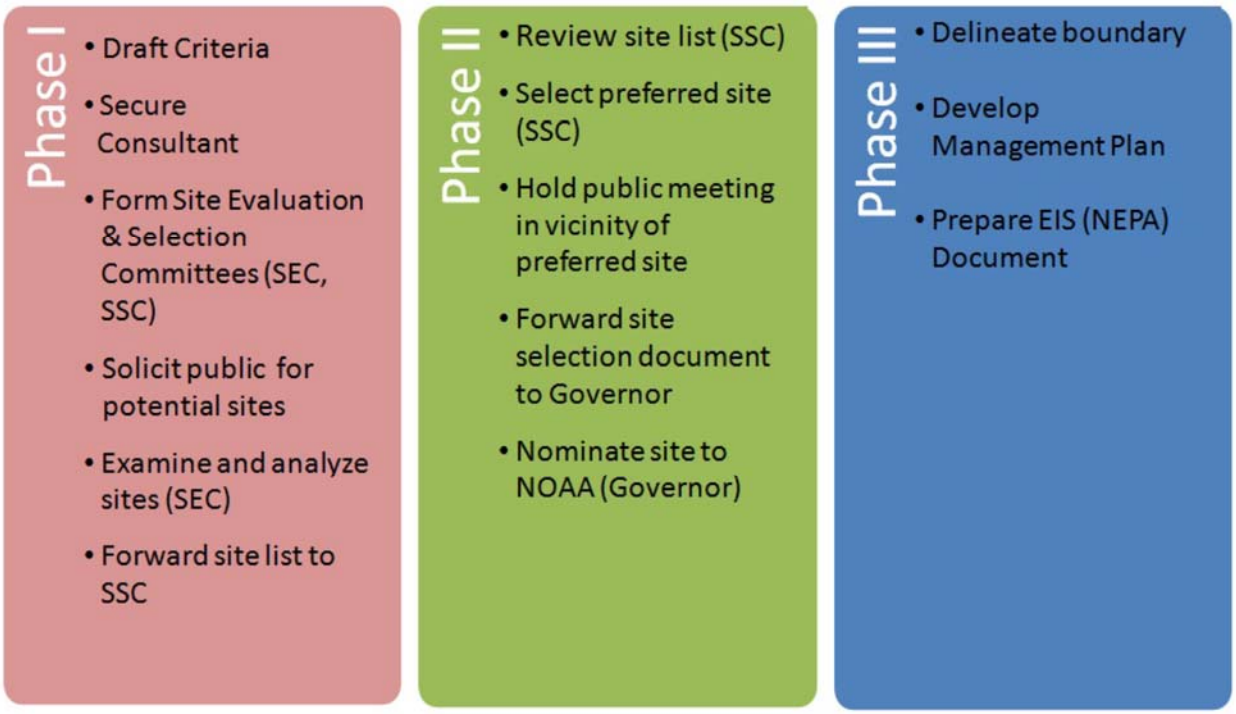

Figure 1.2. NERR Site Selection Process in Hawai‘i

1.2.2 He‘eia NERR Site Description

The He‘eia estuary is located in Kāne‘ohe Bay within the Ko‘olaupoko region on the northeastern or windward shore of the island of O‘ahu (Figure 1-3). Kāne‘ohe Bay is the largest sheltered body of water in the Hawaiian Islands, with a total surface area of 18 square miles (11,000 acres). The bay is about 8 miles

long; oriented northwest to southeast, 2.6 miles wide, and protected by an outer barrier reef. The bay receives relatively large freshwater inputs from numerous streams originating from the eastern-facing and windward slopes of the central Koʻolau Mountain Range. The barrier reef has a major influence on the circulation of waters in the bay, creating diverse aquatic habitats. Compared to an open coastline, the semi-enclosed nature of the bay makes it more vulnerable to damage by factors associated with urbanization and agricultural development (Jokiel 1991). The Heʻeia estuary is in the southern portion of Kāneʻohe Bay. The estuary is influenced by runoff from the surrounding watershed as well as by the exchange of seawater from the ocean.

The Heʻeia NERR includes the estuary, wetlands, marine waters, and upland areas. The total acreage of the Heʻeia NERR is approximately 1,385 acres. It encompasses Heʻeia State Park to the north, Heʻeia Fishpond in the center, wetlands to the west and south, the University of Hawaii's (UH) Hawaiʻi Institute of Marine Biology (HIMB) property on Moku o Loʻe (Coconut Island) to the east, and a large expanse of marine waters with patch and fringing reefs.

1.2.3 Land Ownership in the Heʻeia NERR

The Heʻeia NERR comprises a mix of public and private lands (Figure 1-4). The public lands in the Heʻeia NERR are owned by three State of Hawaiʻi agencies: DLNR, which owns Heʻeia State Park, coastal parts of Moku o Loʻe, and the marine waters including the Marine Laboratory Refuge wildlife sanctuary that immediately surrounds Moku o Loʻe; University of Hawaiʻi Foundation owns the central part of Moku o Loʻe; and the Hawaiʻi Community Development Authority (HCDA), which owns the wetland and upland areas identified as the Heʻeia Community Development District leased by Kākoʻo ʻŌiwi (see Section 2).

The Heʻeia NERR also includes the Heʻeia Fishpond, a private property owned by Kamehameha Schools. Two kuleana parcels (privately owned Hawaiian homestead lots) that are located within the site boundaries are not included in the Heʻeia NERR. Likewise, the Heʻeia NERR boundary was drawn to avoid overlap with private land parcels located in the residential areas adjacent to the site. Table 1-1 lists the properties included in Heʻeia NERR, the landowners and managing entities, and property sizes. Activities related to roads and infrastructure within the Kamehameha Highway right of way located within the NERR external boundary are excluded from the NERR management operations described in this management plan.

The mix of public and private land ownership create both opportunities and challenges for the Heʻeia NERR. Since the State does not have ownership or management control over the private land of the Heʻeia Fishpond, it is only through the cooperation of the private land owners that the boundaries of the Heʻeia NERR includes the critical portion of the Heʻeia estuary that flows into Kāneʻohe Bay through the fishpond. Challenges created by the private land ownership include limited public access.

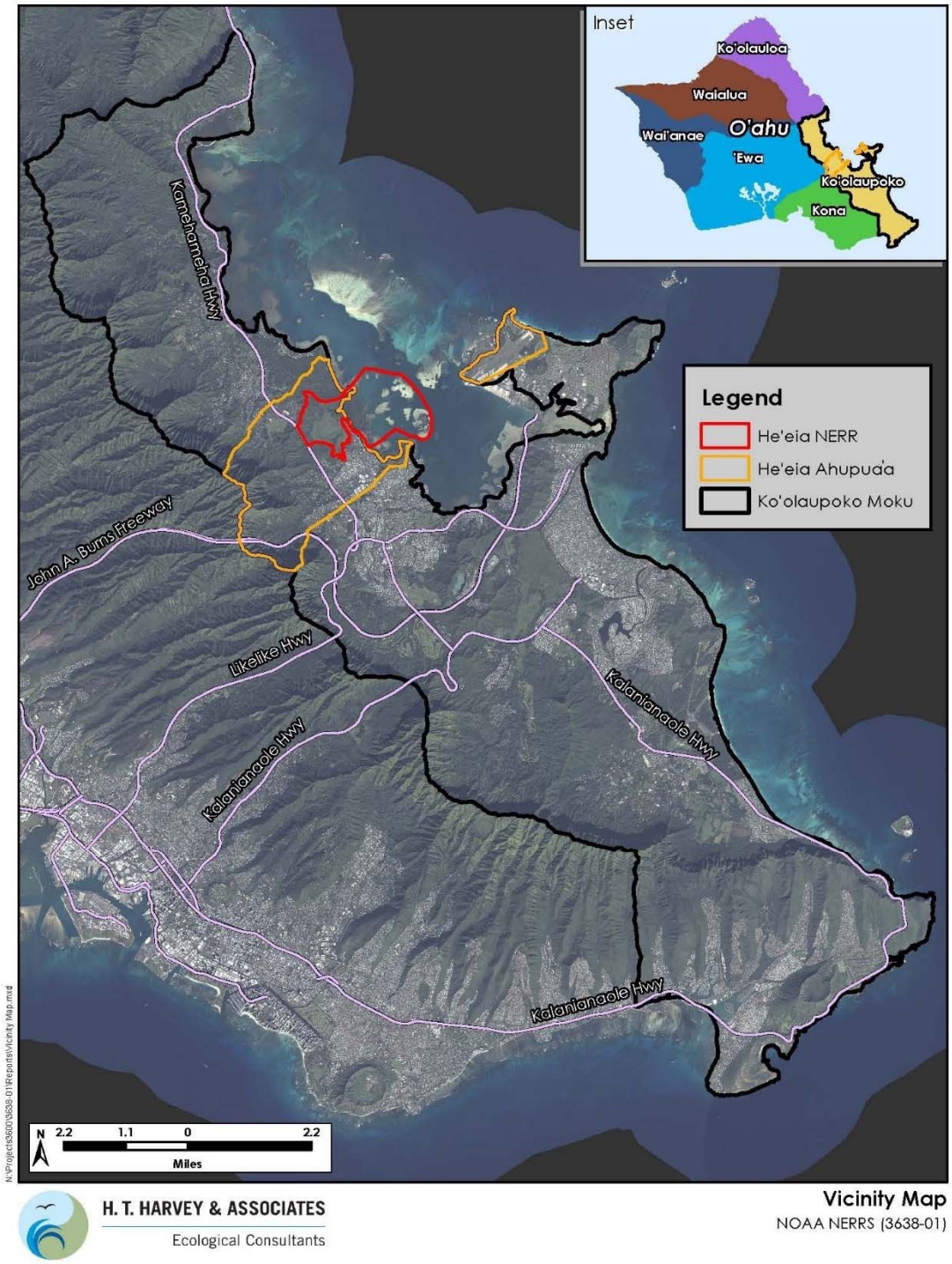

Figure 1.3. Location of He‘eia NERR in Kāne‘ohe Bay in the Ko‘olaupoko Region of O‘ahu

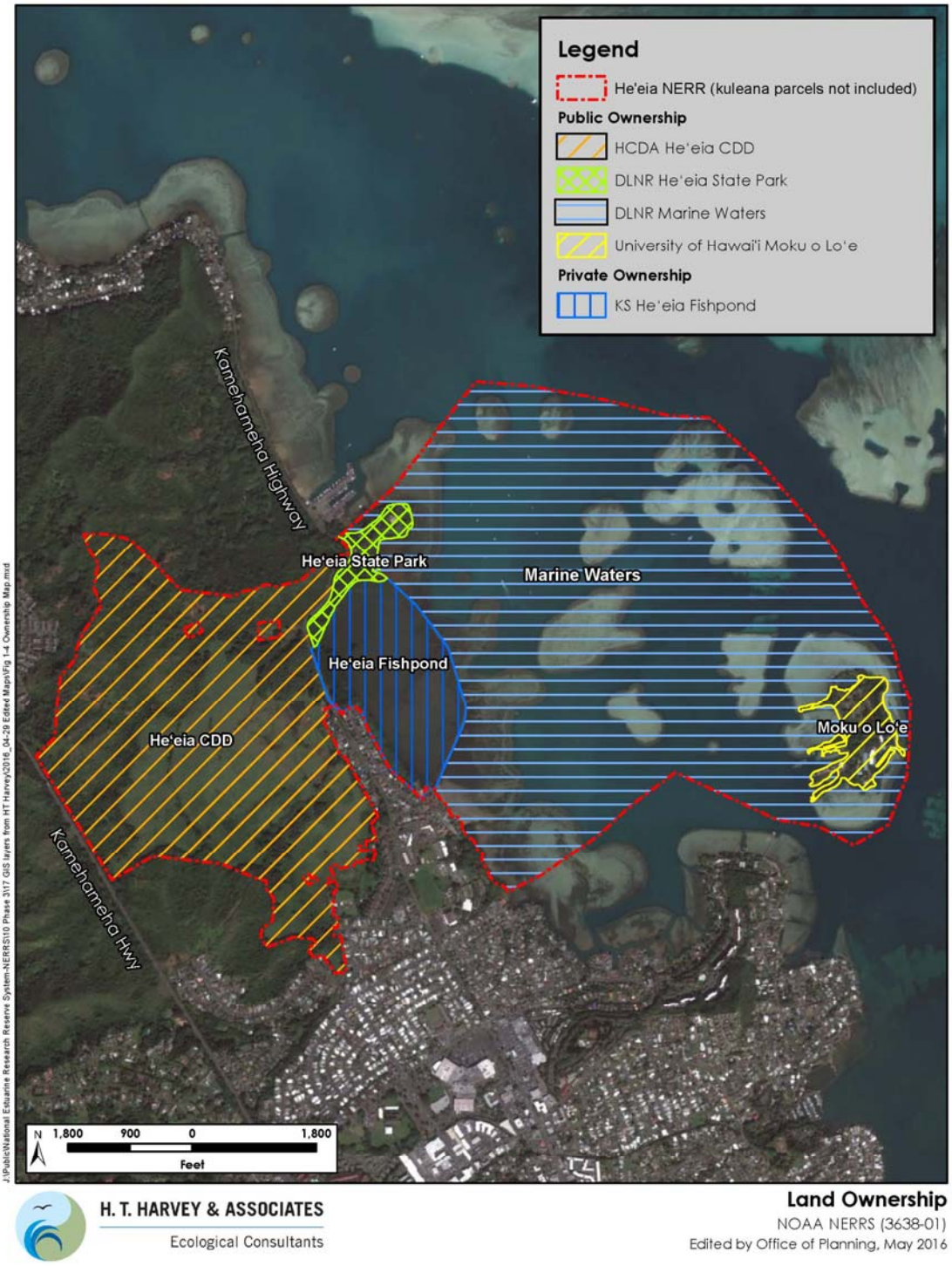

Figure 1.4. Land Ownership in He‘eia NERR

Table 1-1. Landownership, Managing Entity, and Acreage of Properties within the He‘eia NERR

Property Name or Land Type	Landowner	Managing Entity	Approximate Area (acres)
Public lands			
He‘eia State Park	DLNR	State Parks Division/ Kama‘āina Kids (lessee)	19
Marine waters	DLNR	Division of Aquatic Resources/Land Division	822
Moku o Lo‘e	University of Hawai‘I Foundation	HIMB	28
He‘eia CDD	HCDA	Kāko‘o ‘Ōiwi (lessee)	419 (not including health center parcel)
Private lands			
He‘eia Fishpond	Kamehameha Schools	Paepae o He‘eia (lessee)	97
Total acres			**1385**

Notes: DLNR = Department of Land and Natural Resources; HCDA = Hawai‘i Community Development Authority; HIMB = Hawai‘i Institute of Marine Biology.

1.2.4 He‘eia NERR Boundary Description

1.2.4.1 Boundary Criteria

NOAA’s criteria for determining the boundaries of a NERR are outlined in the Code of Federal Regulations (15 CFR 921.11). These criteria are summarized below:

- **Key land and water areas that approximate an ecological unit:** Reserve boundaries must encompass an adequate portion of key land and water areas of the natural system to approximate an ecological unit and should encompass resources representative of the total biogeographic habitat.
- **Encompass areas with adequate controls:** NOAA regulations require that there be a level of control over uses and activities to ensure that the ecological integrity of the reserve is maintained for sustained research and education. Specifically, the regulations state that reserve boundaries must encompass the area within which adequate control has or will be established by the managing entity over human activities occurring within the reserve.
- **Management considerations:** The administrative burden and responsibility for operating a reserve and associated research, stewardship, and educational programs should be a significant consideration in the site selection process and in the delineation of the reserve boundaries. Given the limited funds available to support reserve programs, it is also important to develop a reasonable boundary that will establish a credible reserve without creating an overwhelming administrative burden.

- **Research, Monitoring, education, and stewardship needs and goals:** The research, monitoring, education, and, particularly in the case of the He‘eia NERR, the cultural and land stewardship needs and goals of the reserve, are important considerations in developing a boundary. These needs and goals define the purpose of establishing a reserve and should play a primary role in defining boundaries and guiding future land acquisition needs.

1.2.4.2 Core and Buffer Area Rationale

Federal regulations (15 CFR 921.11) state that reserve boundaries generally encompass two areas: core and buffer areas. The regulations define key or “core” land and water areas as containing ecological units of a natural estuarine system which preserves, for research purposes, a full range of significant physical, chemical, and biological factors contributing to the diversity of fauna, flora, and natural processes occurring within the estuary (See Section 1.2.4.3 for a description of the core area in the He‘eia NERR).

> [The core area is] so vital to the functioning of the estuarine ecosystem that it must be under a level of control sufficient to ensure the long-term viability of the reserve for research on natural processes...[These areas] should encompass resources that are representative of the total ecosystem which, if compromised, could endanger the research objectives of the reserve.

The He‘eia NERR core areas were selected based on the following criteria:

1. They are vital to the function of the He‘eia estuary.
2. State can maintain a sufficient level of control over the areas to ensure the long-term viability of the He‘eia estuary for research and natural processes.
3. The areas encompass resources representative of the He‘eia estuary system.
4. The preservation of the core areas will contribute to the preservation of a full range of significant physical, chemical, and biological factors essential to the diversity of fauna, flora, and natural processes occurring within the He‘eia estuary, as determined through:
   - the *Recovery Plan for Hawaiian Waterbirds* (U.S. Fish and Wildlife Service [USFWS] 2011),
   - the *Kāne‘ohe Bay Master Plan* (OP 1992), and
   - the *Atlas of Hawaiian Watersheds and Their Aquatic Resources, Bishop Museum and Division of Aquatic Resources* (Parham et al. 2008).

The federal regulations (15 CFR 921.11) define a buffer area as an “area adjacent to or surrounding key lands and water areas and essential to their integrity. Buffer zones protect the core area and provide additional protection for estuarine-dependent species.” The buffer area may include areas for research and education facilities (See Section 1.2.4.4 for a description of the buffer area in the He‘eia NERR).

The He‘eia NERR buffer areas were selected based on the following criteria:

- The areas are able to protect the core area and provide additional protection for species that rely on the core area.

- The areas are located adjacent to or surrounding, or are essential to the integrity of, the core area.
- The buffer areas provide an opportunity to accommodate future shifts in the core area as a result of successful restoration or climate impacts.
- Managers can maintain a level of control over the areas sufficient to support the long-term viability of the He‘eia NERR for the recovery of natural processes, as well as for research and education.

1.2.4.3 He‘eia NERR Core Areas

The core area in the He‘eia NERR encompasses about 624 acres of aquatic habitats that are currently managed by the State and are suitable sites for conducting research and monitoring activities (Figure 1-5). The core area is comprised of coral reefs and waters of Kāne‘ohe Bay, including the reef immediately surrounding Moku o Lo‘e. The coral reefs and open water in the He‘eia NERR are representative of the coral reef ecosystem in Kāne‘ohe Bay as well as of the Hawaiian Islands archipelago. A network of estuaries, fed by multiple streams, is part of the larger bay, and the core area is likewise affected by the influx of fresh water and by changes in the estuarine environment.

Sixty-four acres of coral reefs immediately surrounding Moku o Lo‘e comprise the Hawai‘i Marine Laboratory Refuge. This refuge is highly protected by limitations on public access and a prohibition on the removal of marine organisms, except for research purposes. This high level of protection makes the refuge well suited to being included in the He‘eia NERR core area.

1.2.4.4 He‘eia NERR Buffer Areas

The buffer areas of the He‘eia NERR are contiguous with the core area and encompass about 762 terrestrial and aquatic acres (Figure 1-5). These areas were found suitable to be designated as buffers because they are vital to the long-term viability of the natural process and research and educational activities, and these areas are also currently used for, or planned to be used for, major agricultural, aquacultural, restoration-related, recreational, or commercial activities. The 476 acres of land in the He‘eia NERR buffer area consist of HCDA’s He‘eia CDD, the He‘eia Fishpond, He‘eia State Park, and Moku o Lo‘e. The 286 acres of aquatic areas in the He‘eia NERR’s buffer consist of the He‘eia Fishpond; Patch Reefs #7, 8, 9, and 10; about 111 acres of water immediately surrounding Patch Reef #7, and about 32 acres of water to the south of Patch Reef #10.

The He‘eia Fishpond and the He‘eia CDD were designated as buffer areas because of ongoing and planned aquacultural and agricultural activities, ongoing restoration of the fishpond, and planned removal of mangroves and restoration of this area to natural estuarine habitat. Because these areas provide access and boat mooring facilities, they are suitable for inclusion in the buffer area. The Division of Aquatic Resources (DAR) is proposing to establish a coral reef mitigation bank on Patch Reef #10 and use Patch Reef #9 as a reference site, therefore making these areas suitable for inclusion in the buffer area. DLNR’s Division of

Boating and Ocean Recreation (DOBOR) has designated and manages about 111 acres of water around Patch Reef #7 including a portion of Patch Reef #8 as Ocean Recreation Management Area (ORMA) restricted zones. A portion of these areas are used for water recreation (jet skiing, water skiing, and water sledding). Similarly, about 32 acres of water south of Patch Reef #10 are designated by DOBOR for the mooring of recreational and commercial boats. As such, these waters see relatively high levels of boat traffic and provide access to core marine areas, and were considered suitable for inclusion in the buffer area.

The permitted uses in the core and buffer areas, and existing state and federal laws and regulations that govern these permitted uses, are described in Section 6, in the resource protection plan. The designation of the He‘eia NERR will not change any existing uses; nevertheless, the reserve managers will maintain awareness of land and water uses and ensure that the He‘eia NERR goals and objectives are pursued in harmony with existing uses.

1.3 Ecological Attributes of the He‘eia NERR

1.3.1 Habitats

The habitats in the He‘eia NERR can be broadly categorized as uplands, wetlands, freshwater stream, estuarine and coastal, and marine (Figure 1-6). These are outlined in the following sub-sections.

1.3.1.1 Uplands

The upland areas in the He‘eia NERR are a mosaic of built-up or developed areas and undeveloped or natural areas. The undeveloped or natural upland areas in the He‘eia NERR occur in (1) He‘eia State Park (19 acres) (Figure 1-7), (2) areas between the He‘eia Fishpond and the residential neighborhood (9 acres) (Figure 1-8), (3) emergent lands on Moku o Lo‘e (28 acres), (4) natural upland and fill areas in wetlands in the He‘eia CDD (approximately 15 to 20 acres west of Kamehameha Highway), and (5) 200 acres of forested land at the foothills of the Ko‘olau Mountains on the HCDA property.

The vegetation in the upland areas is dominated by invasive plant species such as Java plum (*Syzygium cumini*), strawberry guava (*Psidium guajava*), ironwood (*Casuarina equisetifolia*), octopus tree (*Schefflera actinophylla*), and koa haole (*Leucaena leucocephala*) (Krauss 1976, Lamoureux 1983, Calvin and Kim 1990, PBR Hawai‘i 1993, Townscape 2011a). Few native plant species such as pili (*Heteropogon contortus*), ‘ākia (*Wikstroemia* sp.), mountain naupaka (*Scaevola gaudichaudii*), and ‘ōhi‘a lehua (*Metrosideros collina*) occur within the forested upland areas of the He‘eia NERR on HCDA lands (Krauss 1976). The native loulu palm (*Pritchardia sp.*), naupaka (*Scaevola sericea*), and indigenous hala (*Pandanus tectorius*) and hau (*Hibiscus tiliaceus*) trees also grow in He‘eia State Park and in the residential neighborhood adjacent to the He‘eia NERR (Lamoureux 1983, Weissich 1993). No rare, threatened, or endangered plants are known to occur in the He‘eia NERR except for a single plant of the endangered Achyranthus (*Achyranthes splendens* var. *rotunda*) which was found to be cultivated in the residential

neighborhood near the fishpond. The He‘eia NERR also does not overlap with critical habitat for any threatened or endangered plant species (USFWS 2015a). Restoration of upland habitats in the future has potential to control and remove invasive species and replace these with native plants.

The fauna found in the He‘eia NERR include the common coastal, rural, and urban-introduced birds and mammals typically found in beachsides, gardens, parklands, and agricultural areas on O‘ahu, such as feral cats (*Felis catus*), rats (*Rattus* sp.), common mynas (*Acridotheres tristis*), zebra doves (*Geopelia striata*), northern cardinals (*Cardinalis cardinalis*), common waxbills (*Estrilda astrild*), cane spiders (*Heteropoda* sp.), and the introduced monarch butterfly (*Danaus plexippus*) and honeybee (*Apis mellifera*) (Calvin Kim and Associates 1990, Helber Hastert & Fee 2007, Community Planning and Engineering, Inc. 2014). No threatened or endangered forest birds have been reported to occur in the reserve; however, based on historical or regional records, the Hawaiian owl (*Asio flammeus sandwichensis*) and O‘ahu creeper (*Paroreomyza maculata*) have the potential to occur in the He‘eia NERR (Townscape 2011a). It is suspected that Hawai‘i’s only terrestrial native mammal, the Hawaiian hoary bat (*Lasiurus cinereus semotus*), may occur in the He‘eia NERR, because it is known to forage over ponds and bays and roost in dense forests similar to the hau and mangrove vegetation in the He‘eia NERR (Helber Hastert & Fee 2007, Community Planning and Engineering, Inc. 2014). As with the plants, none of the upland habitats in the He‘eia NERR are identified as proposed or listed critical habitat for any endangered species (Helber Hastert & Fee 2007, Townscape 2011a, Community Planning and Engineering, Inc. 2014, USFWS 2015a).

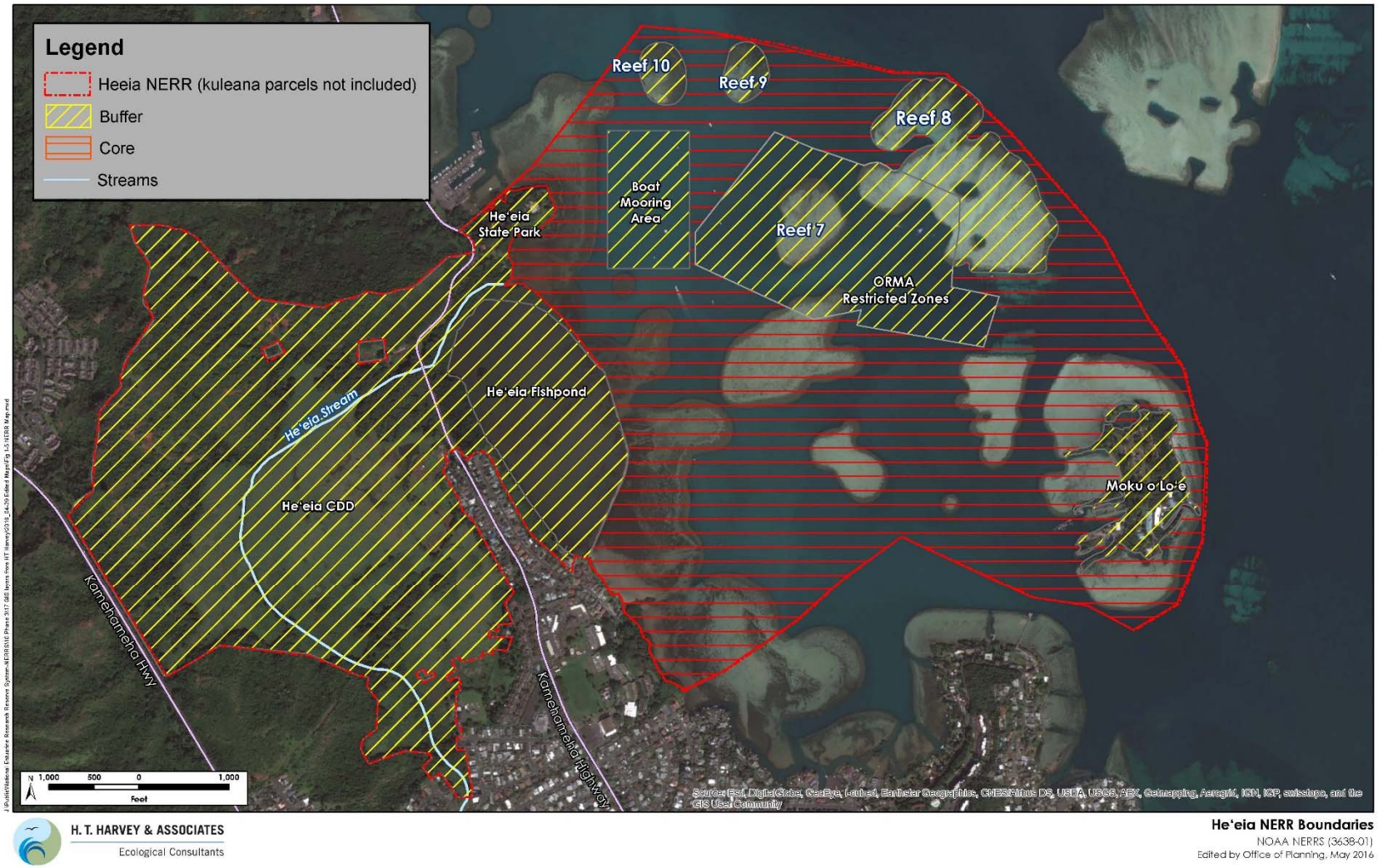

Figure 1.5. Core and buffer areas of the He'eia NERR

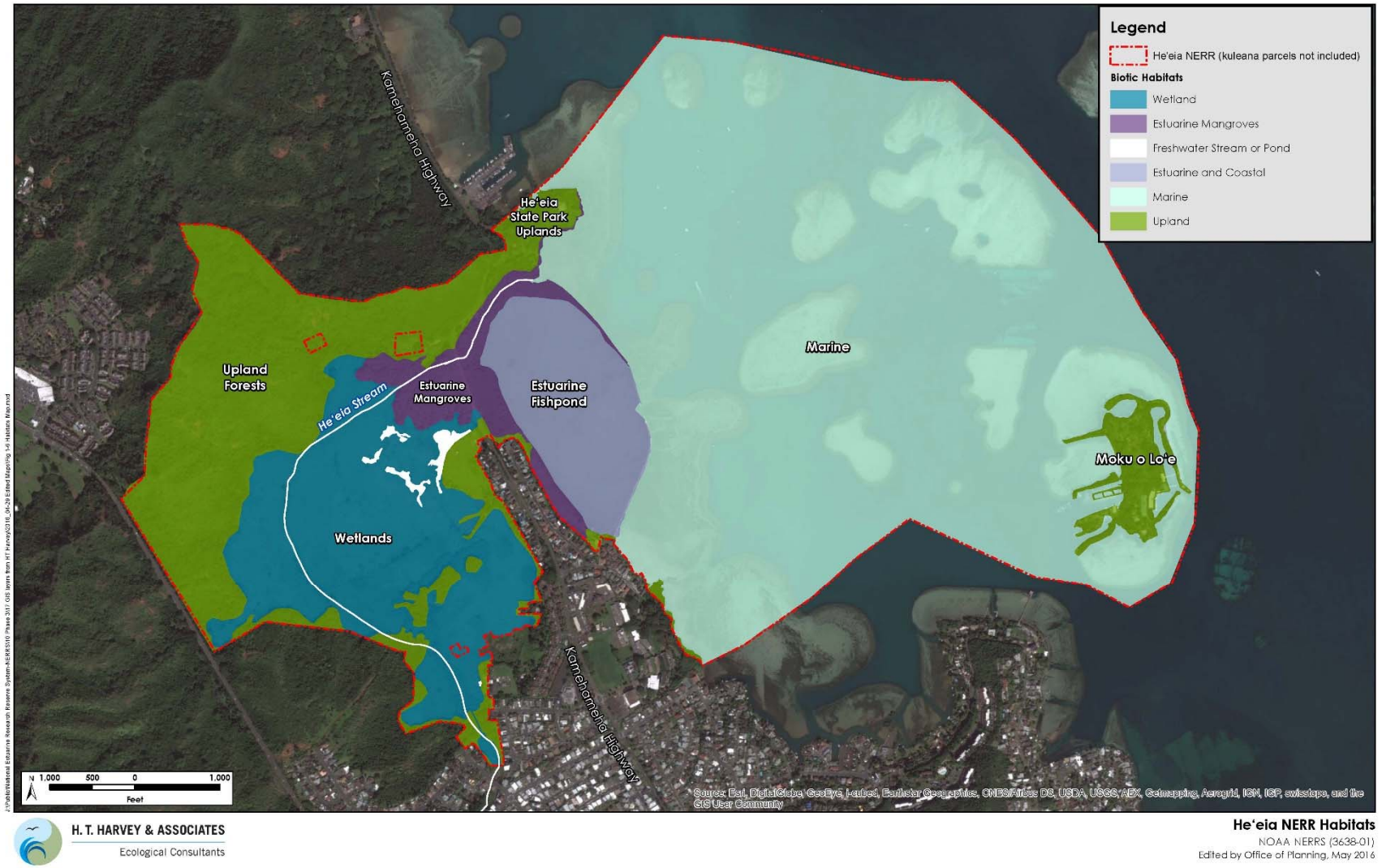

Figure 1.6. He'eia NERR habitat types

Figure 1.7. Landscaped upland area at He‘eia State Park

(Photo courtesy of H. T. Harvey & Associates)

Figure 1.8. Area adjacent to He‘eia Fishpond

(Photo courtesy of H. T. Harvey & Associates)

1.3.1.2 Wetlands

The wetlands in the He‘eia NERR are fed by the waters of Ha‘ikū Stream and Ioleka‘a Stream, which converge upstream of the wetlands to form He‘eia Stream. Five types of wetlands (based on the National

Wetlands Inventory, USFWS 2015b) occur within the He‘eia NERR boundaries: (1) estuarine and marine deepwater, (2) estuarine and marine wetland, (3) freshwater emergent wetland, (4) freshwater forested/shrub wetland, and (5) freshwater pond (Figure 1-9). These different types of wetlands in the He‘eia NERR occur on (1) HCDA lands to the west of Kamehameha Highway; (2) along the banks of the He‘eia Stream in He‘eia State Park; (3) along the northwestern, western, and southwestern walls of the fishpond (USFWS 2015b); and (4) in estuarine and marine deepwater portions of Kāne‘ohe Bay (Figure 1-9). The estuarine and marine deepwater type wetland is discussed below under the marine habitat type (Section 1.3.1.5), and the estuarine and marine wetland is discussed below under the estuarine and coastal habitat type (Section 1.3.1.4).

The freshwater and emergent wetland in the He‘eia NERR largely comprises the He‘eia Stream, marsh, and seasonally wet grasslands. He‘eia Stream, along the southwestern boundary of the He‘eia NERR, is lined with dense hau trees. Throughout its course in the wetlands, He‘eia Stream is choked by California grass (*Urochloa mutica*) and other invasive species that impede its flow and water quality (Townscape 2011a, Hawai‘i Department of Health [HIDOH] 2014). Kāko‘o ‘Ōiwi plans to restore the stream channels with native riparian plants to create habitat for native aquatic fish, shrimp, and other organisms now absent from the stream (see Section 2.3). Enhancing the presence of native plants in these areas through the restoration of the area (Section 11) will provide additional ecosystem services such as native wildlife habitat, shoreline stabilization and soil and nutrient retention.

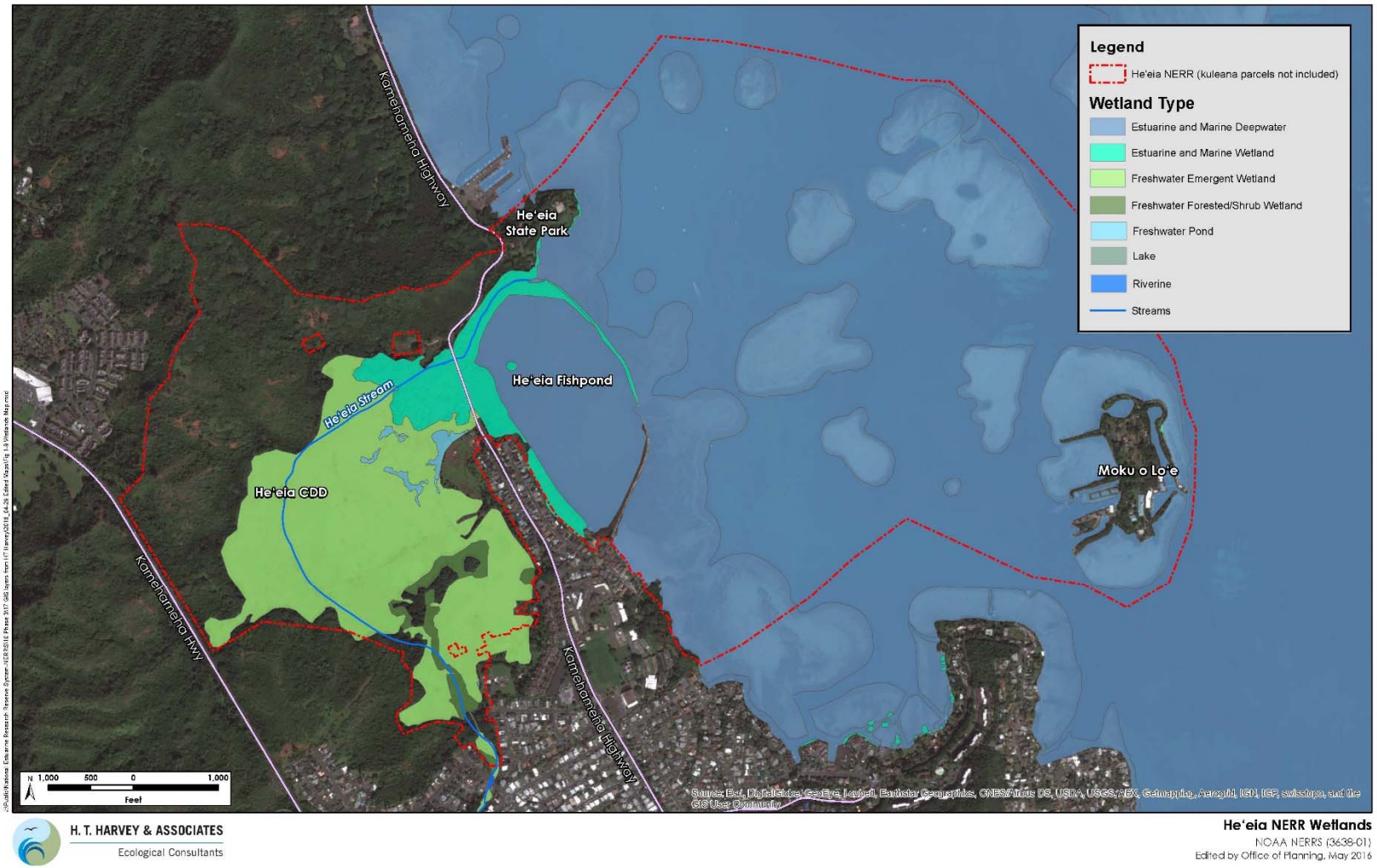

Figure 1.9. National Wetland Inventory (NWI) wetland types in the He'eia NERR

The marsh habitat consists mostly of the floodplain of He‘eia Stream and is extensively overgrown with California grass, which occludes open water areas (Calvin Kim and Associates 1990, Townscape 2011a, U.S. Department of Agriculture [USDA] 2011) (Figure 1-10). The marsh habitat is known to occasionally provide feeding and loafing habitat for four endangered waterbirds: Hawaiian gallinule (*Gallinula chloropus sandvicensis*), Hawaiian duck or koloa (*Anas wyvilliana*), Hawaiian coot (*Fulica alai*), and the Hawaiian stilt (*Himantopus mexicanus knudseni*). The dense growth of California grass in the He‘eia marsh is believed to have a significant negative impact on native waterbird habitat (Calvin Kim and Associates 1990, Townscape 2011b).

Figure 1.10. Dense growth of California grass (*Urochloa mutica*) in He‘eia wetland area

(Photo courtesy of H. T. Harvey & Associates)

Seasonally wet grasslands are located downslope of the floodplain, above the residential neighborhoods. They flood and become marshy in the rainy season, when they are covered by up to 1 foot of water (Calvin Kim and Associates 1990). Dominated by California grass, these seasonally wet grasslands also support a variety of nonnative facultative and obligate wetland plant species such as sedge (*Frimbristylis littoralis*), Job’s tears (*Coix lachrymal-jobi*), arrowhead (*Sagittaria sagittaefolia*), and kamole (*Ludwigia octivalvis*).

The freshwater forested/shrub type wetland occurs in a narrow belt around the upland habitat in the southern part of the He‘eia CDD. This forested/shrub type wetland comprises trees like java plum (*Syzygium cumini*) and shrub species such as cat’s claw (*Caesalpinia decapetala*), Cuba jute (*Sida rhombifolia*), koa haole (*Leucaena leucocephala*), and guava (*Psidium guajava*). At the southern boundary of the He‘eia NERR, where He‘eia Stream enters the He‘eia CDD, this wetland type supports a thick forest of hau trees (Townscape 2011a and b).

The freshwater pond is represented by natural open water ponds located above the mangrove forests (Figure 1-9). These ponds have mixed native and nonnative vegetation; native plants present include makaloa (*Cyperus laevigatus*) and neke (*Cyclosorus interruptus*) ferns (Townscape 2011a).

Fauna identified in the wetland habitats includes cane toad (*Pantala flavescens*); globe skimmer dragonfly (*Crocothemis servilia*) and three other dragonfly species (red, blue-green, and purple *Ischnura* spp.) near shallow stagnant water; a *Heteropoda* sp. cane spider; cyclid fish, mosquitofish, and crayfish in the demonstration loʻi and ponds; and mallard-koloa hybrid, Shama thrush (*Copsychus malabaricus*), and Pacific golden plover (*Pluvialis fulva*) (Townscape 2011a). Domestic ducks, black-crowned night herons (*Nycticorax nycticorax*), and cattle egrets (*Bubulcus ibis*) also have been recorded in waterbird surveys at the site (DOFAW unpublished data). Biannual waterbird counts conducted at Heʻeia marsh confirm that the site is used by all four endangered waterbirds, albeit in low numbers. Bullfrogs (*Rana catesbiana*) have been observed in small ponds in the seasonally wet grasslands (Calvin Kim and Associates 1990).

Kākoʻo ʻŌiwi, through its Māhuahua ʻAi o Hoi (Re-growing the fruit of Hoi) project (see Section 6.3.1), plans to establish a land management program to return the wetlands of Heʻeia, also known as "Hoi," to productive agricultural, cultural, and educational use. In cooperation with the Natural Resources Conservation Service (NRCS), the group has developed a detailed conservation plan (Townscape 2011b), the implementation of which is in progress. This work includes rehabilitating wetlands to loʻi kalo (Townscape 2011b) (Figure 1-11). The conservation plan comprehensively addresses concerns regarding the soil, water, animals, plants, and air resources involved in the rehabilitation of the loʻi kalo.

Figure 1.11. Taro patch in Heʻeia wetland area

(Photo courtesy of H. T. Harvey & Associates)

1.3.1.3 Freshwater Stream

The He‘eia Stream is listed in the Hawai‘i Stream Assessment (Parham et al. 2008) as a small perennial stream containing moderate aquatic resources. In ranking streams according to a suite of ecological diversity and resilience factors, Parham et al. (2008) assign streams a standardized score from 1 to 10, with 1 being the poorest and 10 being the best. He‘eia Stream received a Stream Biological Rating of 4, and is noted to contain moderately important biological resources that include diverse native and introduced macrofauna (Townscape 2010). The stream goby, *Awaous guamensis* (‘o‘opu nākea) (Figure 1-12), was identified as occurring in the stream, as well as seven other native aquatic (fish) species and five introduced species (Townscape 2011a). Largest of the Hawaiian gobies, *A. guamensis* is the only one of the five species of ‘o‘opu that is not endemic to the Hawaiian Islands. This species is also found in Guam, New Caledonia, Vanuatu, and Fiji, and is considered indigenous in Hawai‘i.

In 2001–2003, the Hawai‘i Biological Survey examined the lower reaches and nearshore estuarine waters of He‘eia Stream and documented a total of six fish species: the endemic flagtail (*Kuhlia xenura*) and flathead gray mullet (*Mugil cephalus*); the indigenous great barracuda (*Sphyraena barracuda*); and the introduced western mosquitofish (*Gambusia affinis*), shortfin molly (*Poecilia mexicana*), and tilapia (*Tilapia melanothera*) (Englund et al. 2003). Only two species of insect were documented by Englund et al. (2003), one of these being the indigenous dragonfly (*Pantala flavescens*). Parham et al. (2008) report

Figure 1.12. Indigenous stream goby ‘O‘opu Nākea (*Awaous guamensis*)

(Photo courtesy of Annette Tagawa, Division of Aquatic Resources)

15 fish species and the endangered blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*) to occur in He‘eia Stream, based on eight surveys conducted in the lower and middle sections of the stream between 1975 and 2003. Low aquatic insect diversity may be attributed to the high-salinity environment of lower He‘eia Stream.

1.3.1.4 Estuarine and Coastal

The upper intertidal areas of the He‘eia NERR, including the seaward portion of the He‘eia Fishpond and lower reaches of He‘eia Stream (Figure 1-6), are dominated by mangroves and estuarine mudflats, and are inundated by fresh water from He‘eia Stream and by seawater when the tide is high (Figure 1-13). Large fluctuations in water quality in the estuary cause abrupt changes in dissolved oxygen, pH, salinity, and temperature (Jokiel 1991). These areas function as breeding and nursery habitat for marine life and attract many resident coastal species that are tolerant of changes in salinity.

Red mangrove (*Rhizophora mangle*) is the dominant species, followed by the *Bruguiera* species *B. sexangula* and *B. gymorhiza.* The mangroves capture sediment and organic material that are transported downstream and deposited in the estuary, creating a silty mud bottom along the coast. The expansion of mangroves and deposition of sediments over time has reduced the estuarine environment and altered water flow patterns with respect to both the stream channel locations and the extent of tidal incursions. Although the mangroves are not native, they are known to harbor a variety of marine and estuarine organisms that are sought for bait and food. The habitat provided by the mangrove prop roots and associated fouling assemblages (e.g., algae, invertebrates) provide habitat for juvenile fish which, as adults, populate freshwater or marine environments (Calvin Kim and Associates 1990, Brooks 1991).

Figure 1.13. Mangrove invasion of estuarine habitat in lower reaches of He‘eia Stream

(Photo courtesy of H. T. Harvey & Associates)

The expansion of mangroves has also substantially reduced the area of marshland habitat once used by native waterbirds (Calvin Kim and Associates 1990, Brooks 1991, Helbert Hastert & Fee 2007). The USFWS recovery plan for endangered waterbirds describes He‘eia as a site that historically had value as a

complex of tidal marshes and open water areas, but which has been substantially modified and presently consists of nonnative mangroves, remnants of ponds, and wet pasture. The recovery plan recommends that He‘eia be restored and managed by the state to provide enhanced habitat for endangered waterbirds (USFWS 2011).

Kāko‘o ‘Ōiwi, through its Māhuahua ‘Ai o Hoi Project, and after a required environmental review process, plans to remove approximately 20 acres of the mangroves that are choking the stream channel and to replace them with native plants such as baby tears (ae‘ae, *Bacopa monnieri*), many spike flat sedge (*cyperus polystachios*), java sedge (ahu awa, *cyperus javanicus*), pili grass (*Heteropogon contortus*), and sea purselane (akulikuli, *Sesuvium portulacastrum*) that will serve as habitat for birds and as a nursery for juvenile fish (Townscape 2011a, 2011b). The endangered Hawaiian hoary bat likely roosts in the mangroves (Helber Hastert & Fee 2007), so removal of the mangroves will be conducted outside of the bat’s breeding season to avoid impacts on the species.

Migratory shorebirds are found in the He‘eia NERR and use the coastal habitats, estuaries, marshes, wetlands, and grasslands in the area. The limited lawn habitat in the He‘eia NERR could be used by the Pacific golden plover (Helber Hastert & Fee 2007). The *Pacific Islands Shorebird Conservation Plan* (Engilis and Naughton 2004) identifies Kāne‘ohe Bay as an important tidal flat used by flocks of shorebirds that forage at low tides. The plan also identifies tidal flats where mangroves have been effectively removed as providing positive benefits to shorebirds.

Figure 1.14. He‘eia Fishpond

(Circa 2011- Copyright: Kalei Nu‘uhiwa)

He‘eia Fishpond, an 88-acre seashore pond is located at the center of the He‘eia NERR and is completely surrounded by a rock wall (Figure 1-14). The waters of the pond receive freshwater inputs from He‘eia

Stream, which drains the He‘eia watershed and empties into the northwestern corner of the fishpond. The fishpond retains a brackish character resulting from tidal flux of seawater from the adjacent Kāne‘ohe Bay. Water flows into and out of the fishpond are regulated by a series of eight sluices. The pond has been used primarily as a site to promote aquaculture using traditional cultural practices of resource management (Helber Hastert & Fee 2007).

Fish species that live in the He‘eia Fishpond and adjacent fresh and estuarine waters include Hawaiian ladyfish (‘ama‘ama, *Elops hawaiensis*), milkfish (awa, *Chanos chanos*), Dussumier’s surgeonfish (palani, *Acanthurus dussumieri*), flagtail (āholehole, *Kuhlia* spp.), threadfin (moi, *Polydactylus sexfilis*), porcupinefish (kokala, *Diodontidae*), barracuda (kākū, *Barracuda barracuda*), mullet (‘ama‘ama, *Mugil cephalus*), and juvenile trevally (pāpio, *Carangidae*). The waters of the fishpond also contain various species of brackish water shrimp (‘ōpae, *Atyidae*), moray eel (puhi, *Gymnothorax* spp.), and mollusks (invertebrate animals in the Phylum: Mollusca) (Townscape 2010, Paepae o He‘eia 2013).

1.3.1.5 Marine

The coastal waters of Kāne‘ohe Bay are influenced by a combination of estuarine and marine processes, and support a dynamic ecological structure composed of diverse assemblages of marine invertebrates, coral, and fish. The He‘eia NERR’s open waters are located between the southeastern and central sections of Kāne‘ohe Bay; the waters in this area are characterized by relatively high rates of freshwater input and slower overall rates of circulation.

Three distinct physiographic zones that define the marine environment of Kāne‘ohe Bay were described by Jokiel (1991)—inshore, inner bay, and outer bay. Most of the inshore area is fronted by shallow fringing reef <3.3 feet deep that extends 1,640–2,460 feet off shore (Figure 1-15). Seaward of this fringing reef and the intertidal zone lie the inner bay and lagoon, which include patch reefs containing rich coral colonization, algal communities including invasive algae, and sand and sea grass beds. The inner bay waters support abundant planktonic organisms (Smith et al. 1981, Taguchi and Laws 1987, Ringuet and Mackenzie 2005) and a diverse assemblage of reef-associated and pelagic fish species (Jokiel 1991, Hunter and Evans 1995). The inner bay receives considerably more oceanic enrichment than do the inshore waters because of its physiography relative to the open ocean. The outer bay is fronted by a barrier reef complex that slopes gently seaward and receives considerable marine nourishment, owing to wind-driven mixing of surface waters and transport of deeper oceanic waters into the bay.

In total, about 25% of the more than 6,500 currently described species of Hawaiian coral reef organisms are endemic (Fautin et al. 2010), and many of these are found among the diverse habitats of Kāne‘ohe Bay (Figure 1-16). Kāne‘ohe Bay is considered an outstanding world-class scientific and field research setting because of the complex patch reef structure, fringing reef that extends the landward margin, well-flushed lagoon, and diversity of habitats and organisms present (Bahr et al. in prep.).

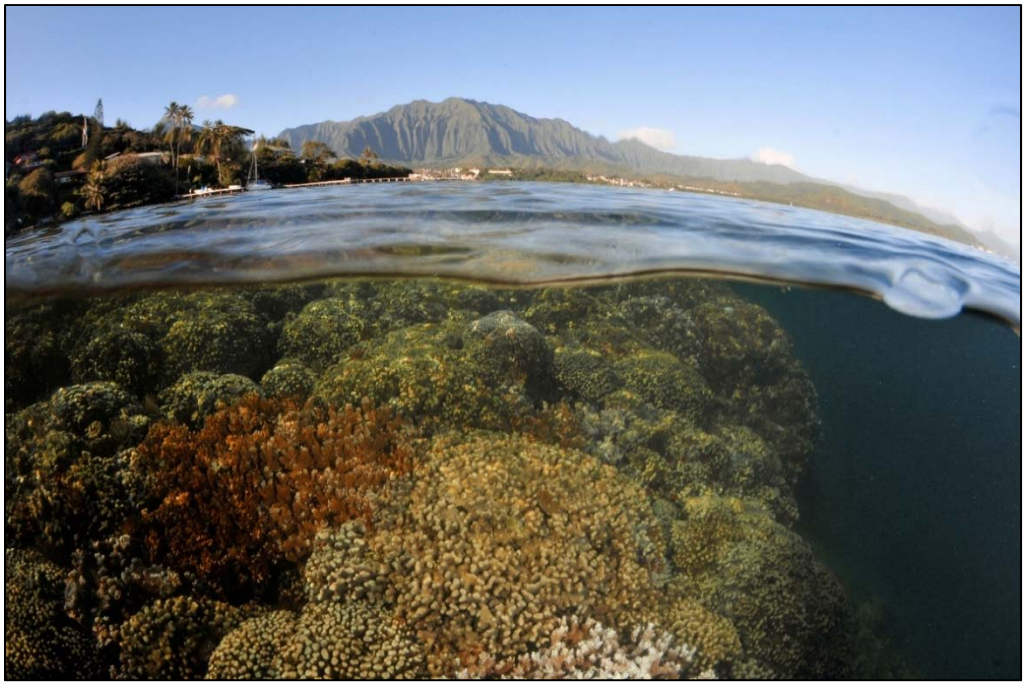

Figure 1.15. Shallow fringing reefs in Kāneʻohe Bay

(Photo: Copyright Andre Seale)

Figure 1.16. Tropical coral reef habitat in Kāneʻohe Bay

(Photo courtesy of Hawaiʻi Institure of Marine Biology)

1.3.2 Watershed and Hydrology

The He‘eia watershed totals 3.5 square miles (2,240 acres) (Parham et al. 2008) and extends beyond the boundaries of the He‘eia NERR, up the Ha‘ikū and He‘eia valleys, to the peak of the Ko‘olau Mountains. Ha‘ikū and ‘Ioleka‘a Streams merge to form the perennial He‘eia Stream, which runs through the He‘eia NERR. This watershed includes lands that are zoned for urban, agricultural, and conservation uses. Figure 1-17 depicts the boundary of the watershed and the location and extent of the different land use types in He‘eia.

One of the unique attributes of the He‘eia NERR is that the watershed and ahupua‘a[3] are close and accessible to the community and researchers. The total length of He‘eia Stream from the top of the forested upper reaches of the watershed to the end of the stream mouth as it enters Kāne‘ohe Bay is only 7.1 miles (Parham et al. 2008). One can stand at the mouth of the stream and look up to see the origins of the stream and watershed at the top of the Ko‘olau Mountains.

Groundwater resources in the He‘eia NERR were described in the Kāko‘o ‘Ōiwi Conservation Plan (Townscape 2011):

> The aquifer beneath the proposed site is within the Ko‘olau Poko Aquifer System of the Windward Aquifer Sector. This aquifer mainly consists of high level dike-impounded groundwater. There are many groundwater seeps and springs in the wetlands of He‘eia. The property area is located on the ocean side of the HIDOH [Department of Health] Underground Injection Control (UIC) Line. There are no groundwater wells located onsite or in the vicinity of the property. The nearest groundwater wells are located in Upper Ha‘ikū Valley, on the mountainside end of He‘eia watershed. These wells are not listed as having contaminants.

He‘eia watershed quality is considered “impacted” owing to the amount of impervious surfaces (18.41%), and most of the impervious surfaces (in the form of high-intensity development) are located just upstream of the He‘eia NERR (Kailua Bay Advisory Council 2007) (Figure 1-17). Discharge records from He‘eia Stream at Ha‘ikū Valley, approximately 0.5 mile upstream of the He‘eia NERR, indicate that high flows occur regularly in the watershed (U.S. Geological Survey [USGS] 2015) (Figure 1-18), and associated erosion and sedimentation are a concern for both the watershed and health of Kāne‘ohe Bay. Coral health in the bay in particular has been negatively affected by nutrients and sediment-rich freshwater inputs (Guidry et al. 2013).

Actions that are part of the Kāko‘o ‘Ōiwi Māhuahua ‘Ai o Hoi Project (“Re-Growing the fruit of Hoi”) are likely to benefit the watershed and hydrology of the area. Invasive plants, such as California grass and other

[3] See “Ahupua‘a: A Cultural Orientation,” at the beginning of this management plan for a detailed description of this concept.

nonnative plants that are constricting flows in the He‘eia Stream channel are being removed, along with invasive mangrove trees in the upper intertidal area and fishpond, which are acting as a sediment trap, filling the fishpond and contributing to destabilization of the fishpond walls (Townscape 2011a). Also, there are plans to create detention ponds just above the wetlands in the southern portion of the He‘eia NERR, to help detain sediments and debris during storm events and thus reduce impacts on wetlands and agricultural areas (Townscape 2011a).

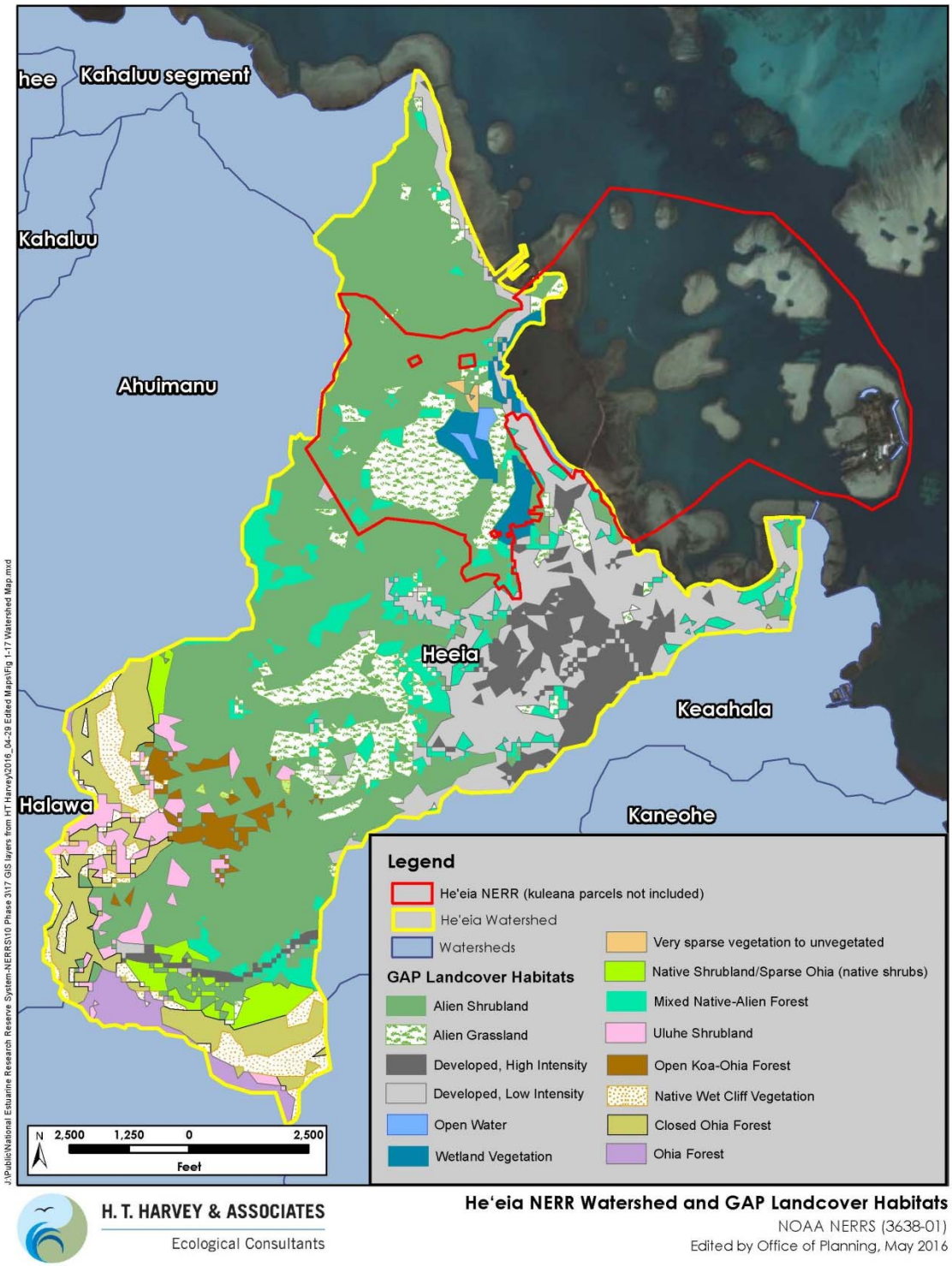

Figure 1.17. Land Cover Types in the He'eia Watershed

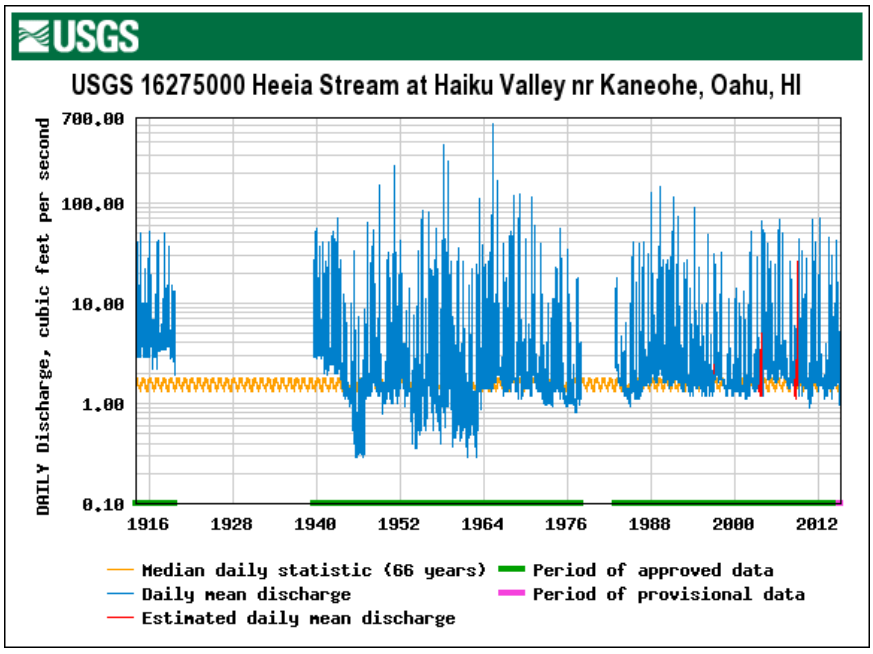

Figure 1.18. Daily discharge of fresh water from He‘eia Stream (in cubic feet per second) near Kāne‘ohe, 1914-2014

(U.S. Geological Survey 2015)

1.3.3 Water Quality

The water bodies in the He‘eia NERR consist of the perennial He‘eia Stream, the estuary, He‘eia Fishpond, and the semi enclosed Kāne‘ohe Bay (Figure 1-6). Water quality in these water bodies is important, because it affects the health of fish and coral populations in the bay, the quality of drinking water on land, and the resilience of natural water systems in the face of climate change.

Observed water quality impairment in the He‘eia NERR likely originates in the uplands. Runoff from uplands may include sediments naturally eroding from forestlands; nitrates from fertilizer runoff, septic tanks, sewage, or erosion of natural deposits; and pollutants from urban development and road construction (Sumiye 2002). Nutrient and sediment-rich fresh water runs off into Kāne‘ohe Bay, especially during storm events, which induces phytoplankton blooms and threatens the health of the coral reefs in the bay (DeCarlo et al. 2007, Drupp et al. 2011, Guidry et al. 2013).

HIDOH is required by Clean Water Act (CWA) Section 303(d) to report on the state’s water quality on a 2-year cycle, and to submit a list of waterbodies that do not meet state water quality standards, plus a priority ranking of listed waters for total maximum daily load (TMDL) development, based on the severity of pollution and the uses of the waters (HIDOH 2014). Both He‘eia Stream and Kāne‘ohe Bay are on the list for nonattainment of one or more of the water quality standards, so their status is reported on a 2-year cycle

(HIDOH 2014). As of 2014, He‘eia Stream had not met the standards for nitrate+nitrite-nitrogen (NO_3+NO_2) and total phosphorus (TP) during both the wet and dry seasons, but had attained the standard for turbidity, total suspended solids (TSS), and total nitrogen (TN) (HIDOH 2014). Kāne‘ohe Bay (Central Region, in the He‘eia NERR) had not met the standards for TN, NO_3+NO_2, ammonia-nitrogen (NH_3), and turbidity, but there was insufficient data to evaluate bacteria, TP, and chlorophyll-*a* (chl-a) (HIDOH 2014). As of November 2016, the HIDOH draft Integrated Report reports that Heeia Stream is still listed for total nitrogen (dry season only) and nitrate + nitrite (both wet and dry seasons). Kāne‘ohe Bay (Central Region, in the He‘eia NERR) is listed for total nitrogen, nitrate + nitrite, ammonium, and turbidity for the wet season.

Since 2012, He‘eia has been a priority watershed under HIDOH’s Clean Water Branch (CWB) Polluted Runoff Control Program (PRCP). The PRCP has funded projects in He‘eia under the Clean Water Act (CWA) Section 319 that aim to reduce sediment and nutrients in the watershed. Additional projects are planned in the watershed to contribute to the goal of delisting He‘eia Stream for at least one pollutant by 2020. Water quality monitoring in He‘eia Stream is also planned until 2020 (DOH CWB 2015). In order to ensure monitoring and restoration efforts are coordinated, the He‘eia NERR will actively engage with the PRCP and monitoring and analysis sections of the CWB during the development and implementation of the He‘eia NERR monitoring program.

1.3.4 Geology

The He‘eia NERR is located on the windward side of the Ko‘olau Mountains, which are characterized by steep cliffs and short ridges less than 4 miles long, topography that contributes to rapid runoff and low infiltration (Ko‘olau Mountains Watershed Partnership 2002). The soils in the He‘eia NERR, at the base of these mountains, are described below.

The soils in much of the He‘eia wetlands are comprised mostly of Hanalei silty clay (HnA) and Marsh soils (MZ) (Townscape 2011a) (Figure 1-19). In a typical profile, Hanalei silty clay is composed of poorly drained silty clay and silty clay loam from 0 to 36 inches in depth. This clay is frequently flooded and occasionally ponded, and has a moderate available water capacity. Marsh soil is composed of mucky peat from 0 to 60 inches in depth. It is very poorly drained, frequently flooded and ponded, and has a very high available water capacity.

The uplands to the north of the wetlands were characterized as Waikāne silty clay, with slopes of 25 to 40% (WpE) and ‘Alaeloa silty clay, with 15 to 70% slopes (AeE and ALF). The hillside soils are silty and well drained, although they have less water capacity than the soils in the wetlands and are classified as highly erodible. Landslide areas are visible on the hillsides, and sheet/rill and road erosion are a concern (Townscape 2011a).

The shoreline of Kāneʻohe Bay is ringed by shallow fringing reefs, and the bay has numerous patch reefs that occur less than 3.3 feet from the surface and are partially exposed during extreme spring tides (Jokiel 1991). As discussed, several of these patch reefs are located in the Heʻeia NERR. The bottom of Kāneʻohe Bay consists of coral rubble, gray coral muds, and fine coral sands, with fine brown silts and clays nearshore, especially near stream mouths (Jokiel 1991). Four major islands and islets are located in Kāneʻohe Bay: Kapapa, Mokoliʻi (Chinaman's Hat), Kekepa (Turtleback Rock), and Moku o Loʻe. The 28-acre Moku o Loʻe is the only one of the four that is situated in the Heʻeia NERR; this island is a basaltic outcrop formed by the old Koʻolau volcano and is surrounded by fringing reefs (Jokiel 1991).

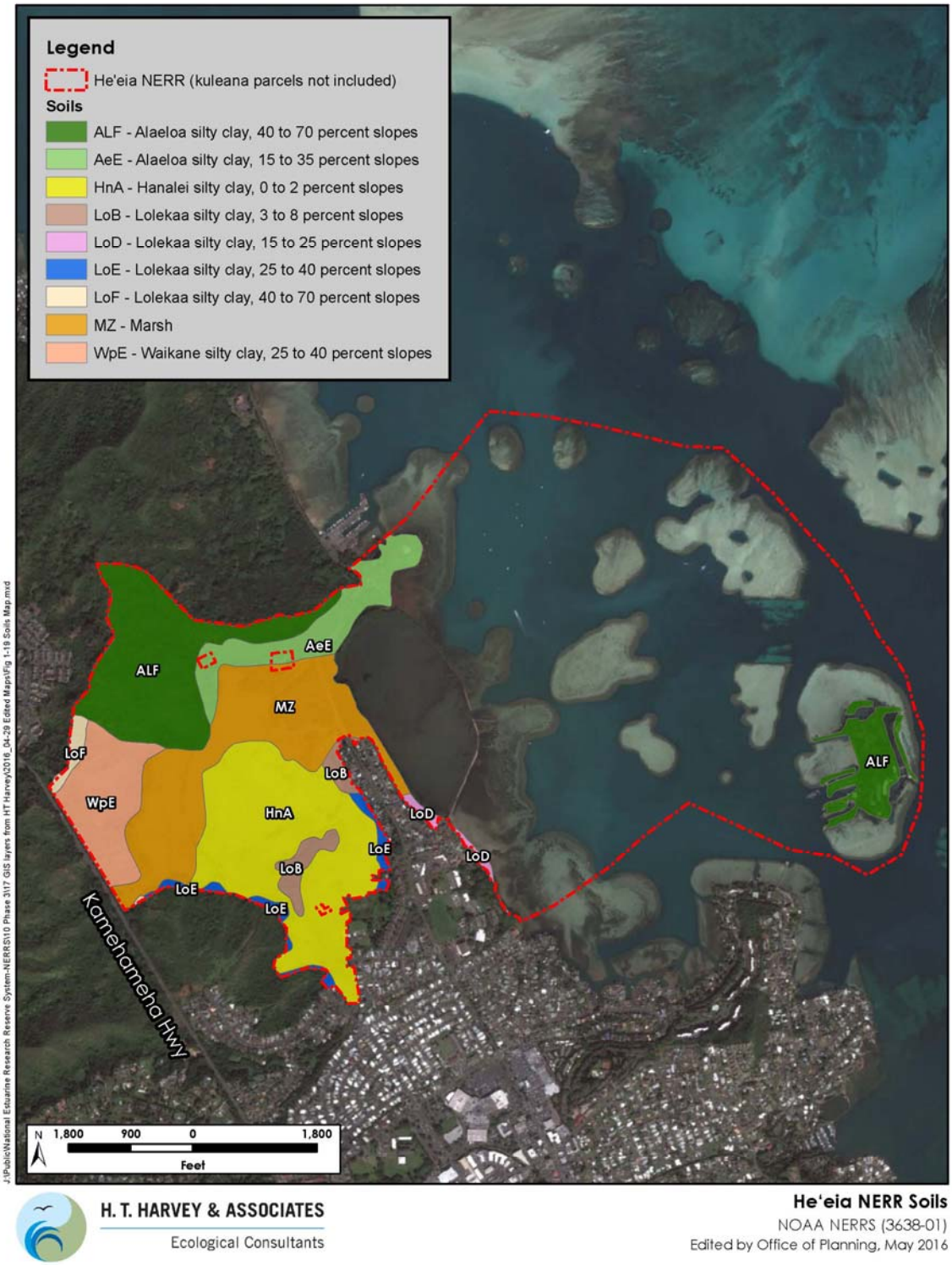

Figure 1.19. Soil Map of He'eia NERR

1.3.5 Climate

The He‘eia NERR is located on the windward side of O‘ahu, which experiences cooler temperatures and higher rainfall than the leeward side of the island. Trade winds from the northeast bring warm moist air to land. The moisture is deflected up along the Ko‘olau Mountains, where the warm air cools, forms clouds, and releases rain. The mountains above the He‘eia NERR experience frequent rainfall, whereas the coastal areas receive moderate to frequent rainfall (Giambelluca et al. 2013) (Figure 1-20), most of which occurs from October through May, with occasional heavy storms. The average annual air temperature ranges from 71 to 85°F, averaging 78°F (U.S. Climate Data 2015).

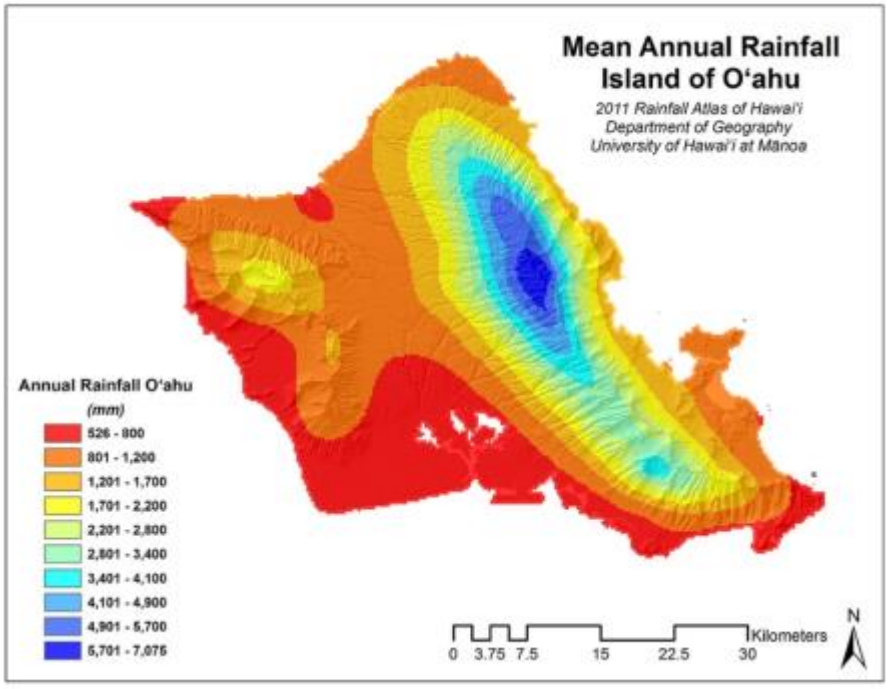

Figure 1.20. Mean Annual Rainfall on the Island of O‘ahu

(Giambelluca et al. 2013)

Climate change in the Hawaiian Islands has been observed and is predicted to continue in the form of rising sea surface and air temperatures, sea level rise, ocean acidification, and declining rainfall and streamflows, with more of the rainfall occurring in intense downpours (Codiga and Wager 2011, Nurse et al. 2014). Ocean acidification, caused by rising atmospheric carbon dioxide concentrations and subsequent increases in dissolved inorganic carbon and carbon dioxide in ocean waters, may reduce the recruitment rate and growth of corals in Kāne‘ohe Bay (Jokiel et al. 2008, Kuffner et al. 2008). Sea level rise, which is predicted to be approximately 1 foot by 2050 and 3 feet by 2100 (Codiga and Wager 2011), could result in saltwater intrusion into the He‘eia wetlands and taro lo‘i, and may overtop the fishpond walls. Changes in rainfall

patterns to more intense downpours could affect hydrology and decrease water quality in He‘eia Stream and Kāne‘ohe Bay.

Methane emissions from the He‘eia wetlands could exacerbate climate change impacts—wetlands are a natural source of methane, which is a greenhouse gas (Mitsch et al. 2013). However, tropical wetlands are predicted to function as a net carbon and radiative sink within the next 300 years and balance out the methane emissions (Mitsch et al. 2013). The He‘eia wetlands may also provide a natural flood buffer that accommodates sea-level rise without the need for additional hard armoring or other measures to protect upstream urban development (Codiga and Wager 2011). Therefore, the He‘eia wetlands may increase the overall resilience of the ecosystem to climate change.

1.4 Archaeological and Cultural Resources in He‘eia NERR

The ahupua‘a of He‘eia is located in the moku (district) of Ko‘olaupoko. It is bounded by the ahupua‘a of Kahalu‘u in the north and by Kāne‘ohe in the south and extends eastward across Kāne‘ohe Bay to include the tip of the left lobe of the Mōkapu Peninsula and also Moku o Lo‘e (Coconut Island) (Cruz and Hammatt 2012) (Figure 0-2).

The mountainous section of the ahupua‘a is marked by the stunning Ko‘olau cliffs, heiau (places of worship), and caves. Pu‘u Keahiakahoe (the first of Ka-hoe Hill) is the tallest pu‘u (peak) on the Ko‘olau overlooking the ahupua‘a of He‘eia and Kāne‘ohe. Along the cliffs lived the earth goddess, Kāmeha‘ikana, who lived in a cave named Kaualehu (the ash rain). The cave is believed to have once contained burials and is visible from the site of a former heiau called Kahekili (the thunder), of which a solitary stone remains today (Cruz and Hammatt 2012).

The valley of Ha‘ikū at the base of the Ko‘olau mountains is an area rich in springs and streams, which allowed the lo‘i kalo (irrigated taro terraces) to flourish. The gods Kāne and Kanaloa obtained their drinking water from a spring called Kapuna, and the abundant fresh water irrigated the lo‘i kalo. At the bottom of the ‘Ioleka‘a pali (cliff) is a pool associated with the legendary rat called ‘Ioleka‘a (rolling rat) (Cruz and Hammatt 2012).

The coastal waters of Kāne‘ohe Bay once contained at least thirty loko i‘a (fishponds), including the He‘eia Fishpond. The kia‘i (guardian) of the He‘eia Fishpond, Meheanu, lived on a small nearby section of the land called Luamo‘o (lizard water spirit pit) and had the power to change herself into a mo‘o (lizard) or a puhi (eel), depending on the color of the hau (hibiscus) thickets. Hawaiians regarded Kealohi Point (the shining) as a leina ‘uhane (leap of the soul), a place where the souls of the dead leap into the sea. The west side of the peninsula of Mōkapu (sacred island) belonged to the ahupua‘a of He‘eia and included fishing ko‘a (shrines) (Cruz and Hammatt 2012).

Beyond the rich moʻolelo of the area, the Koʻolaupoko moku and, in particular, the ahupuaʻa of Heʻeia sustained a dense population (Cruz and Hammatt 2012) based on a robust and flourishing agricultural and aquacultural community. Owing to the frequent rainfall, abundant water resources, and flatlands, the area also is known to have contained the most extensive early wetland agricultural complex on Oʻahu.

The Mahele (land division) records indicate that the area included numerous shoreline fisheries and extensive loʻi kalo. Between the 1840s and 1850s, more than 60 land commission awards were issued for the area, reflecting the ability of this ahupuaʻa to support a vibrant and self-sustaining community.

Heʻeia is associated with wahi pana (sacred places), akua kiaʻi (guardians), demigods, and goddesses (Appendix B). Traditional accounts and several former and existing archaeological features such as burial grounds and heiau also indicate the cultural significance of the ahupuaʻa of Heʻeia as a favored and important place during traditional Hawaiian times.

The Heʻeia NERR site has been subject to numerous archaeological and cultural resource studies (McAllister 1933, Yent and Griffin 1977, Kawachi 1990, Nagata 1992, Henry 1993, Freeman and Hammatt 2004, Carson 2006, Altizer 2011, Cruz and Hammatt 2012, Groza and Monahan 2012, Soltz et al. 2014). McAllister (1933) was the first to document the major sites around Oʻahu in 1933; with regard to Heʻeia, he documented three cultural sites: Heʻeia Fishpond, Kaualaukī Heiau, and the dwelling place of Meheanu at Luamoʻo.

The Heʻeia Fishpond was listed on the National Register of Historic Places (50-80-10-327) in 1973. However, an inventory of historically and culturally significant areas in and immediately around the fishpond boundaries identified no specific cultural resources other than the fishpond itself (Cruz and Hammatt 2012). Archaeological assessment of the replacement of the caretaker's house at Heʻeia Fishpond also did not identify any surface or subsurface cultural resources (Carson 2006). A literature review and field inspection for a Heʻeia Fishpond wall repair project identified no potential adverse effects on cultural resources and recommended no further archaeological work (Groza and Monahan 2012). A separate cultural impact assessment (CIA) done for the Heʻeia Fishpond involved community consultation and formal interviews (Cruz and Hammatt 2012). This CIA discussed the important relationship between Heʻeia Fishpond and inland taro loʻi, which mitigated the effects of flooding on the fishpond. The CIA also discussed that the fishpond may include Traditional Cultural Properties (TCPs) of ongoing cultural significance, which may be included in the State Historic Register. The CIA concluded that the fishpond wall repairs would not adversely affect cultural practices and resources.

Surface and subsurface archaeological surveys of Heʻeia State Park in 1977 (Yent and Griffin 1977) did not report any significant findings. However, relevant to the area, a 1982 report documented iwi (ancestral remains) at Heʻeia State Park, which was confirmed by a 1992 (Nagata 1992) archaeological survey of the same parcel. An archaeological and cultural impact study conducted for the Kamehameha Highway

waterline project did not identify any historical properties or traditional cultural practices, and Keʻalohi Point was noted as leina ʻuhane (leap of the soul) (Freeman and Hammatt 2004).

Literature and field review for portions of the Kakoʻo ʻŌiwi Māhuahua ʻAi o Hoi project ("Re-Growing the fruit of Hoi") documented a precontact (i.e. predating 1778) basalt quarry, the foundation of an ʻōkolehao distillery, two ranching enclosures, fences and roads possibly related to agriculture, and possible subsurface loʻi berms (Altizer 2011). Work conducted at the Kakoʻo ʻŌiwi property identified the following 17 sites (Soltz et al. 2014) (Figure 1-21):

- Site 7521, plantation-era road
- Site 7522, basalt quarry with traditional debitage
- Site 7523, concrete foundation, possibly for ōkolehao distillery
- Site 7524, ranching-era enclosure
- Site 7525, ranching-era enclosure
- Site 7526, glass and ceramic fragment scatter
- Site 7527, glass and ceramic fragment scatter and three depression features
- Site 7528, four plantation-era depressions with glass and ceramic fragments
- Site 7529, stone and mortar L-alignment
- Site 7530, complex of five terraces and two mounds
- Site 7531, World War II–era earthen terrace and foxhole depressions
- Site 7532, plantation-era road, possibly to/from rice mill
- Site 7533, plantation-era bridge
- Site 7534, plantation-era ʻauwai
- Site 7535, two concrete platforms/foundations, possibly for rice mill
- Site 7536, ranching-era wooden and metal cattle run
- Site 7537, subsurface loʻi and rice berms

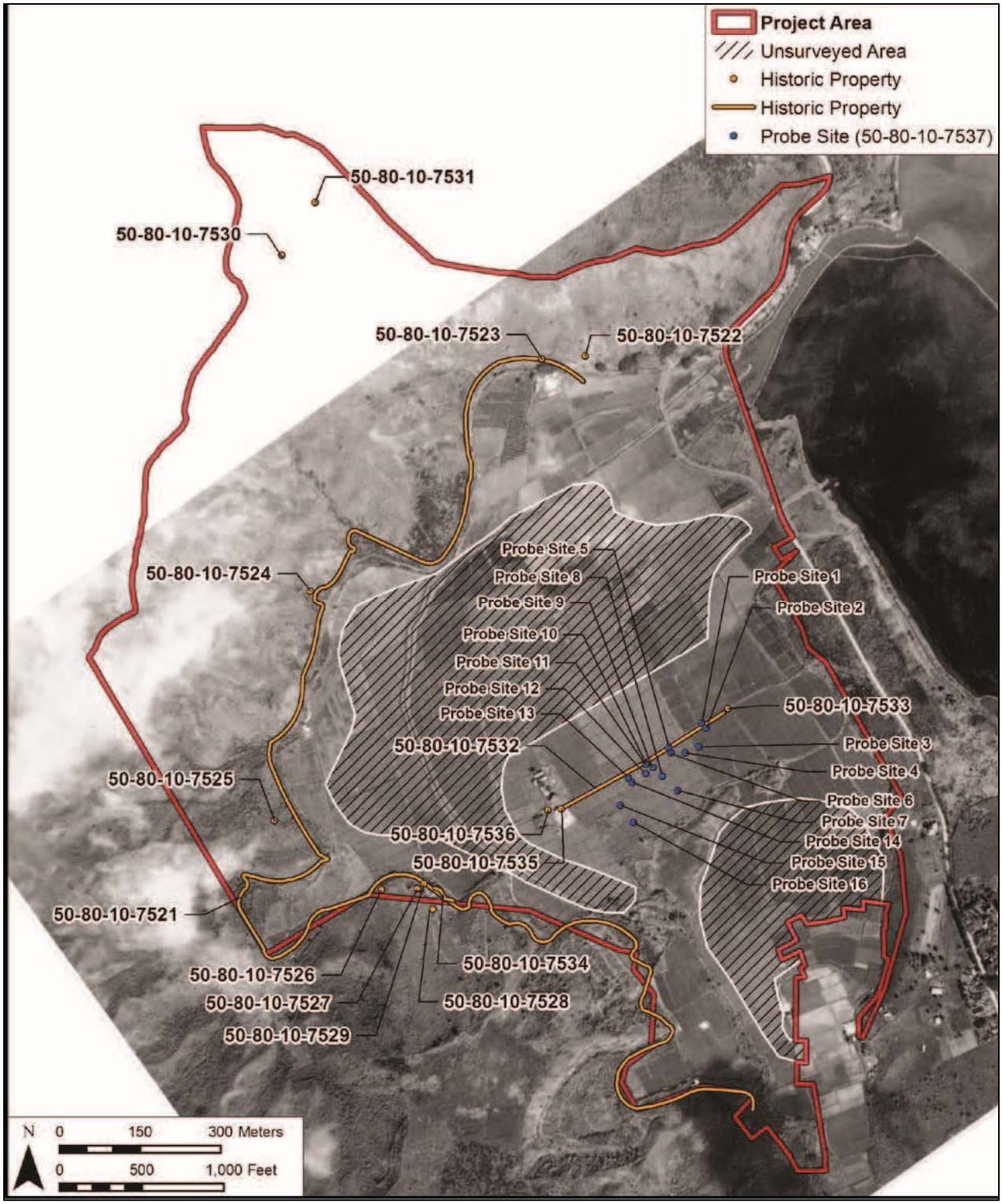

Figure 1.21. Location of archaeological features found in Kakoʻo ʻŌiwi managed lands in Heʻeia CDD

(From Soltz et al. 2014)

Four of these sites: the basalt quarry (Site 7522) and an agricultural complex (Site 7530), both of which predate the first arrival of Europeans sailors in 1778; and the postcontact (i.e., postdating 1778) remains of a rice mill (Site 7535) and an ōkolehao distillery have the potential to be affected by ongoing restoration and habitat manipulation activities by Kakoʻo ʻŌiwi (Site 7523) (Figure 1-21). The rehabilitation of the loʻi kalo includes the rehabilitation of historical roads in order to access these areas. However, any activities proposed in the area containing archeological resources will need to undergo necessary environmental review to ensure that the cultural and archeological sites are protected.

1.5 Socioeconomic Attributes of Heʻeia NERR

1.5.1 Kāneʻohe

For this account of the socioeconomic attributes of the Heʻeia NERR area, the *surrounding community* is defined as the Kāneʻohe Zip Code Tabulation Area (ZCTA). That area includes all the land surrounding Kāneʻohe Bay except for the Marine Corps base that occupies the Mōkapu Peninsula.

The lands surrounding Kāneʻohe Bay, from Kāneʻohe to Kualoa, include nine ahupuaʻa. The ahupuaʻa of Heʻeia extended from the cliffs at the headwaters of Haʻikū and ʻIolekaʻa Streams across the bay to part of the Mōkapu peninsula. Now, Heʻeia is commonly viewed as located within Kāneʻohe.

The Koʻolaupoko region, in which Kāneʻohe is situated, became suburban after World War II, when tunnels and routes through the Koʻolau Mountains connected Kāneʻohe and Kailua with Honolulu. Residential construction took off in the 1960s. In the Heʻeia area (Tax Map Key [TMK] 1-4-6), homebuilding peaked in the 1970s, as the inventory of current homes in (Figure 1-22) indicates. Plans for further urban development in Heʻeia and valleys to the north were put forward in this period, but were opposed by Heʻeia and Waiāhole–Waikāne-area residents.

1.5.1.1 Population

Demographic characteristics of residents of the Kāneʻohe ZCTA are shown in Table 1-2, and based on data from the American Community Survey (ACS) for 2009 through 2013.[4] Comparing the demographic profiles of the ZCTA with those of the City and County of Honolulu as a whole brings out distinctive qualities of the local population:

- Kāneʻohe's age structure is fairly old, with a median age of 41.5 years old.

[4] The ACS is a survey of a sample of the population, conducted every year. Results are published for 1-, 3-, and 5-year periods. Results are made available for smaller areas such as ZCTAs and census tracts using 5-year samples. The most recent data are for 2009 through 2013. Because the ACS is based on samples, it is not a count of the entire population at any one time, comparable to the decennial census. On the other hand, it is less affected by short-term conditions, such as the recession that lasted until 2010.

- Nearly all residents are Hawai‘i-born.
- The ethnic mix of the population is similar to that in the state as a whole.

Table 1-3 shows household characteristics. Renters form a smaller share of the population in Kāne‘ohe than in the State. However, the proportion of renters with high housing costs was higher in Kāne‘ohe than elsewhere. The low proportion of households with more than 1.0 occupant per room suggests that crowding is less of a problem in Kāne‘ohe than elsewhere in Hawai‘i. Indicators of low income and the incidence of disabilities in the population are shown in the next two tables. The share of people with low incomes is smaller in Kāne‘ohe than in the state but the area houses a proportionate number of low-income and minority residents.

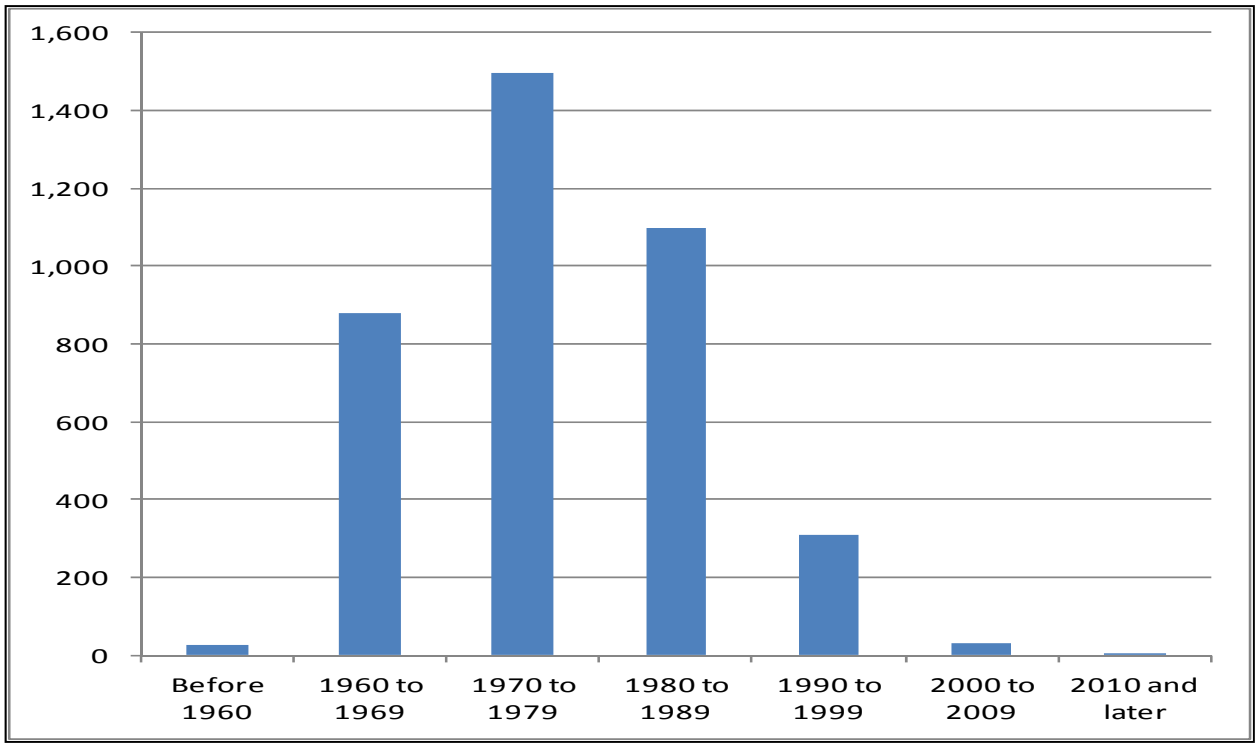

Figure 1.22. Homes in the He‘eia area (TMK 1-4-6), by year built

(Hawai‘i Information Service, Inc. 2015)

1.5.1.2 Economy

The Ko‘olaupoko region includes a major job center (Marine Corps Base Hawai‘i Kāne‘ohe Bay), a hospital (Castle Medical Center, in Kailua), and several shopping centers that offer retail jobs. Windward Mall is the largest retail center. Located at Kamehameha Highway and Ha‘ikū Road, it is just outside the immediate area of the He‘eia NERR. Table 1-6 compares economic characteristics for residents of the Kāne‘ohe ZCTA and the state as a whole.

Table 1-2. Demographic Characteristics, ACS, State of Hawai‘i and Kāne‘ohe ZCTA – 5-Year Profiles (American Community Survey 2013)

	State of Hawai‘i	Kāne‘ohe ZCTA 96744
Population	1,376,336	52,509
Total Population		
Under 5 years	89,223	3,218
5 to 9 years	81,708	2,998
10 to 14 years	83,842	2,954
15 to 19 years	83,355	3,002
65 to 74 years	107,791	4,927
75 to 84 years	63,137	3,160
85 years and over	32,991	1,309
Median age (years)	38.3	41.8
Race		
White	25.00%	21.60%
Black or African American	1.80%	0.80%
American Indian and Alaska Native	0.20%	0.30%
Asian	38.30%	36.20%
Native Hawaiian and Other Pacific Islander	9.80%	8.90%
Hispanic	9.30%	9.10%
Two or more races	23.80%	23.10%
Place of Birth		
Hawai‘i	54.50%	71.10%
Other state	24.70%	18.40%
US Island	2.90%	2.70%
Foreign born	17.90%	7.80%

ACS = American Community Survey; ZCTA = Zip Code Tabulation Area

Table 1-3. Household Characteristics, ACS, State of Hawai‘i and Kāne‘ohe ZCTA

Housing and Households	State of Hawai‘i	Kāne‘ohe ZCTA 96744
Total housing units	522,164	16,786
Occupied housing units	449,771	16,051
Vacant housing units	13.9%	4.4%
HOUSEHOLDS BY TYPE		
Total households	449,771	17,152
Households with one or more people under 18 years	33.7%	31.9%
Households with one or more people 65 years and over	30.7%	35.6%
Average household size	2.96	3.09
HOUSING TENURE		
Occupied housing units	449,771	16,051
Owner-occupied	57.6%	62.9%
Renter-occupied	42.4%	37.1%
Average household size of owner-occupied unit	3.11	3.13
Average household size of renter-occupied unit	2.77	2.87
OCCUPANTS PER ROOM		
Occupied housing units		
1.00 or less	91.2%	97.1%
1.01 to 1.50	5.7%	2.4%
1.51 or more	3.1%	0.4%
Share of households paying > 35% of income for housing (for households with rent or mortgage data)		
Owners	29.0%	29.5%
Renters	46.6%	59.6%

ACS = American Community Survey; ZCTA = Zip Code Tabulation Area

Table 1-4. Share of Persons below the Poverty Line, ACS, State of Hawai‘i and Kāne‘ohe ZCTA

	State of Hawai‘i	Kāne‘ohe ZCTA 96744
PERCENTAGE OF PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL		
All people	11.2%	7.4%
Under 18 years	15.4%	10.4%
18 to 64 years	10.5%	7.3%
65 years and over	7.4%	4.2%

ACS = American Community Survey; ZCTA = Zip Code Tabulation Area

Table 1-5. Share of Persons with Disabilities, ACS, State of Hawai‘i and Kāne‘ohe ZCTA

	State of Hawai‘i	Kāne‘ohe ZCTA 96744
DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION		
Total Civilian Noninstitutionalized Population	1,323,796	52,493
With a disability	10.8%	10.9%
Under 18 years	304,623	11,162
With a disability	3.0%	3.1%
18 to 64 years	819,961	32,238
With a disability	7.9%	7.2%
65 years and over	199,212	9,093
With a disability	34.9%	33.6%

ACS = American Community Survey; ZCTA = Zip Code Tabulation Area

In 2000, employers reported paying some 9,995 employees in the Kāne‘ohe ZCTA. By 2012, this figure had declined to 8,598.[5] The unemployment rate for Kāne‘ohe residents was low (Table 1-6). The share of the workforce employed in agriculture or fishing was even lower than statewide. The average household income for ZCTA 96744 residents was 127% of the state average (Table 1-6).

[5] These figures should be seen as a minimum of local civilian employment. They exclude government jobs. Firms with multiple sites may list employees as based at their headquarters, not other outlets. (U.S. Census 2015)

Table 1-6. Selected Economic Characteristics, ACS, State of Hawai‘i and Kāne‘ohe ZCTA

	State of Hawai‘i	Kāne‘ohe ZCTA 96744
EMPLOYMENT STATUS		
Population 16 years and over	1,104,534	43,953
In labor force	728,795	29,478
Civilian labor force	688,820	28,534
Percent Unemployed	7.1%	5.8%
COMMUTING TO WORK		
Workers 16 years and over	663,718	27,437
Car, truck, or van -- drove alone	66.6%	71.0%
Car, truck, or van -- carpooled	14.4%	16.2%
Public transportation (excluding taxicab)	6.4%	4.6%
Walked	4.7%	2.5%
Other means	3.5%	2.0%
Worked at home	4.5%	3.7%
Mean travel time to work (minutes)	26.0	28.9
INDUSTRY		
Civilian employed population 16 years and over	640,072	26,878
Agriculture, forestry, fishing and hunting, and mining	1.5%	0.6%
Construction	7.0%	9.2%
Manufacturing	3.1%	2.9%
Wholesale trade	2.4%	2.5%
Retail trade	11.8%	10.2%
Transportation and warehousing, and utilities	5.8%	6.9%
Information	1.6%	1.9%
Finance and insurance, and real estate and rental and leasing	6.5%	5.8%
Professional, scientific, and management, and administrative and waste management services	10.1%	9.9%
Educational services, and health care and social assistance	20.9%	25.0%
Arts, entertainment, and recreation, and accommodation and food services	16.2%	9.4%
Other services, except public administration	4.5%	5.1%
Public administration	8.6%	10.6%
Median household income (dollars)	$67,402	$85,608

ACS = American Community Survey; ZCTA = Zip Code Tabulation Area

1.5.1.3 Community Life

Kāneʻohe region residents are represented by Neighborhood Boards (No. 30 for Kāneʻohe, No. 29 for Kahaluʻu). Stakeholders in the bay are represented on the Kāneʻohe Bay Regional Council established by Hawaii Revised Statutes (HRS) 200D to facilitate the implementation and periodic review of the *Kāneʻohe Bay Master Plan*. Kāneʻohe has its own chamber of commerce and sports organizations.

Recreational activities in Kāneʻohe Bay include fishing, sailing, and snorkeling. The sand bar (Ahu o Laka, offshore from Puʻu Maʻeliʻeli) attracts large parties, and DLNR has found the need to enforce rules against unruly behavior and drinking alcohol on holiday weekends (DLNR 2014). The small boat harbor at Heʻeia Kea (just north of the Heʻeia NERR) is the base for many recreational activities in Kāneʻohe Bay. It has docking and mooring space for both commercial and recreational boats. Boaters may also use marinas at Kāneʻohe Yacht Club, Makani Kai, and the Marine base.

Kāneʻohe Bay has little sand and surf. Also on the windward side of Oʻahu, the nearby towns of Kailua and Waimānalo have extensive beach parks. These beach parks are very popular with Oʻahu residents and visitors for many types of ocean recreation.

1.5.1.4 Roads and Traffic Congestion

Kāneʻohe is served by two major routes across the Koʻolau Mountains: Likelike Highway and the H-3 Highway. These cross two major roadways, Kahekili Highway and Kamehameha Highway. The former is wide and serves as the road leading to the North Shore of Oahu. The latter links Kāneʻohe to Kailua to the south. In Kāneʻohe, the major retail centers all front Kamehameha Highway. In Heʻeia, the road narrows and continues along the coast until it joins Kahekili Highway in Kahaluʻu. (From Kahaluʻu northward, the merged route is identified as Kamehameha Highway) (See Figure 7-1).

Traffic volume data from 2013 for the intersection of Kamehameha Highway with Haʻikū and Lilipuna Roads (by Windward Mall) show that more traffic travels toward the center of Kāneʻohe versus north to Heʻeia (Table 1-7).

Table 1-7. Traffic Counts on Kamehameha Highway at Its Intersection with Haʻikū and Lilipuna Roads

Road	Number of Vehicles	
	Northbound on Kamehameha Highway	Southbound on Kamehameha Highway
Kamehameha Highway	2,665	6,740[a]
Haʻikū Road	1,031	6,707
Lilipuna Road	1,808[a]	1,033

Source: City and County of Honolulu 2013.

Notes: Traffic counts from October 2013.

Figures include traffic moving to Haʻikū Road as well as the highway.

1.5.2 The Heʻeia NERR and Its Environs

1.5.2.1 Population

The *environs*[6] of the Heʻeia NERR had some 869 residents in 2010, representing 1.6% of the Kāneʻohe ZCTA population at the time. The environs support scattered residential properties among densely vegetated areas. Many residents have been in the area for multiple generations. Heʻeia Elementary School's description of its community underscores this point:

> We draw from an area where the sense of family and community is strong. Grandchildren and children of former Heʻeia students attend the school. Alumnae have returned to work at the school. Most staff lives in Kāneʻohe or on the Windward side. Our facilities are heavily used by youth sports and community organizations. (Heʻeia Elementary School 2015)

The school reports its student population as 45% Native Hawaiian, 16% Caucasian, and 12% Japanese.

1.5.2.2 Economy

Within the Heʻeia NERR, HIMB is the largest employer with some 19 scientists, about 20 other staff members, and graduate students, volunteers, and visiting researchers. Nonprofits in the area have a small workforce (staff and volunteers, less than 10 each) and call on others for support on community workdays.

[6] The environs are identified here as Census Tract 105.05, blocks 1007 (250 persons in land beside Heʻeia Fishpond and Ipuka Street) and 1008 (585 persons in the Heʻeia wetlands area and areas to the south to Haʻikū Road along Kamehameha Highway), and Census Tract 103.06, block 3001 (34 persons, land makai (seaward) of the highway, including the state park and an area to the north).

1.5.2.3 Community Life

The organizations currently active in He‘eia NERR involve the wider community and are engaged in ongoing efforts to restore the He‘eia ecosystem.

- Kāko‘o ‘Ōiwi—Hawai‘i non-profit organization restoring He‘eia wetlands under a 38-year lease from HCDA
- Paepae o He‘eia—Hawai‘i non-profit organization restoring and maintaining the fishpond under lease from Kamehameha Schools.
- Programs at He‘eia State Park:
  - Kama‘āina Kids programs.
  - Rental of facilities for family events and other group activities.
- HIMB—community involvement with HIMB includes educational visits, volunteer activities, and informal collaboration with other windward O‘ahu programs, including the Kāko‘o ‘Ōiwi and Paepae o He‘eia restoration efforts.
- Several organizations are involved in oversight and support of the nonprofit groups in the He‘eia NERR, notably:
  - Ko‘olaupoko Hawaiian Civic Club (KHCC): This club has encouraged restoration of the wetland by Kāko‘o ‘Ōiwi. Many of its senior members were involved in past efforts to stop urbanization of He‘eia.
  - Hawai‘i Community Development Authority (HCDA): The HCDA obtained ownership of the He‘eia Wetland in 1991 in a land exchange agreement. The He‘eia Community Development District (CDD) was established by the State Legislature in 2011. The He‘eia CDD is governed by the Hawai‘i Community Development Authority board, of which 3 members are representatives from the He‘eia CDD. Kāko‘o ‘Ōiwi, a Hawaii non-profit corporation, currently has a 38 year lease with the HCDA that was executed in 2010. The He‘eia CDD was established to facilitate cultural practices, culturally appropriate agriculture, education and natural resource restoration and management of the He‘eia wetlands.
  - The Nature Conservancy (TNC): The Hawai‘i office of this national nonprofit supports the efforts of Kāko‘o ‘Ōiwi with staff and volunteer contributions.
  - Kamehameha Schools: The estate of Princess Bernice Pauahi Bishop, dedicated to educational activities, has come to assess its Hawai‘i landholdings in terms of ecological and cultural values, as well as economic support for the Schools’ educational activities. Kamehameha Schools owns the He‘eia Fishpond.
  - DLNR: DLNR has set fishing regulations for the marine area of the He‘eia NERR. It runs the small boat harbor at He‘eia Kea, where the harbormaster has limited oversight over recreational

boaters and commercial operators. Its enforcement arm, the Division of Conservation and Resource Enforcement, can enforce fishing and other environmental regulations. The Division of State Parks manages and administers He‘eia State Park. The Divison of Aquatic Resources manages and regulates state marine and freshwater resources, as well as issues fishing licenses.

1.6 Ecosystem-Based Services at the He’eia NERR

Ecosystem-based management (EBM) is a long-term, integrated management approach that recognizes humans are a necessary part of and have significant influences on their environments. EBM embodies a fundamental shift away from ineffective conventional management paradigms that are frequently short term, reactionary, suffer jurisdictional limitations, and consider humans to be independent of nature and inconsistent with conservation goals (McLeod & Leslie 2009). As such, EBM advocates argue for a new holistic, resilience-based approach to ocean and coastal management, which has been heralded as “a critical new course for marine management” (*Science* 2009).

The question remains how best to implement this strategy, and what exactly constitutes EBM as an explicit adaptive management strategy to maximize resilience and sustainability of ecosystem services desired by all stakeholders. The basic premises of EBM are to: 1) prioritize the health and function of the entire ecosystem over the needs of any individual activity or special interest group; 2) be place-based with natural boundaries; 3) account for multiple interactions, and how human actions both within and outside the place can influence or be influenced by management; 4) integrate the concerns of the environment, society, economy and human institutions; 5) consider humans as part of the system and maintain access to cultural ecosystem services demanded by people; and 6) provide a mechanism for coordination among all responsible entities (McLeod & Leslie 2009). Despite widespread consensus on the general tenets of EBM, the specifics of the approach, and the ability to implement EBM, remain a considerable challenge (Levin & Möllmann 2015; Prellezo & Curtin 2015). Table 1-8 outlines examples of ecosystem service metrics that can be measured in the different habitat areas of the He‘eia NERR and against which the effects of management strategies will be measured.

Table 1-8. Examples of Ecosystem Service Metrics

Terrestrial Upland Habitat:
● Soil & nutrient retention
● Species biodiversity
● Native Species recovery (wildlife habitat)
● Cultural traditions
● Clean groundwater

● Stable Hydrology & groundwater recharge ● Economic Security ● Food Security
Estuarine Habitat:
● Soil and nutrient retention ● Sustainable fishery stocks ● Native Species recovery (wildlife habitat) ● Cultural traditions ● Recreational Opportunities ● Food security ● Flood protection ● Shoreline stabilization
Marine Habitat:
● Sustainable fishery stocks ● Species biodiversity ● Native Species recovery (wildlife habitat) ● Cultural traditions ● Recreational Opportunities ● Healthy coral reefs ● Tsunami & storm protection ● Food SecurityThreats and Stressors

1.7 Threats and Stressors

1.7.1 Natural and Anthropogenic Stressors

Kāneʻohe Bay is the largest sheltered body of water in the Hawaiian Islands. The semienclosed nature of the bay makes the Heʻeia estuary more vulnerable than an open coastline to damage by factors associated with urbanization and other human activities (Jokiel 1991). Typical of Hawaiian watersheds located on

small landmasses, the spatial extent of the He‘eia watershed is limited and there are tight links between terrestrial ecosystems and coastal environments directly downstream. Natural and anthropogenic stressors for He‘eia NERR include invasive species, soil erosion, sedimentation, nonpoint source pollution, and ocean recreational activities.

The estuarine ecosystem of He‘eia continues to be threatened by the invasion of non-native mangroves. Extensive efforts have been made to remove mangroves from the fishpond walls but, dense mangrove stands still occupy the upper intertidal areas of the He‘eia NERR, the seaward portion of the fishpond, the lower reaches of the He‘eia Stream, and the mudflats. The mangroves alter stream flow, trap nutrients and sediments from the He‘eia Stream, and confine the intrusion of saltwater upstream. Deposition of nutrients overtime and altered rates of freshwater discharge have significantly reduced the estuarine environment over time. The expansion of mangroves has also reduced the open marshlands once used by native waterbirds.

The He‘eia stream and the associated wetlands also continue to be threatened by invasive California grass that impedes water flow and quality. The stream does not allow for fish passage and therefore is a poor habitat for native fish. Degradation resulting from the introduction of nonnative animals which prey on and displace native species and alter habitat is also a threat to native and indigenous freshwater and estuarine fish and invertebrate species and their habitats (Bishop Museum 2010, Townscape 2010). The forested upland habitats as discussed above (Section 1.3.1.1) are also dominated by non-native vegetation.

Threats to marine resources include displacement of fauna by the introduction and spread of invasive species, pollution, disease, and ocean recreational activities. The coral reefs in He‘eia NERR are currently being restored by removing invasive algae with a mechanical device called the “Super Sucker” (DAR 2013). However, the marine resources are constantly under threat of degradation from sedimentation, diseases, dredging, or the introduction of new invasive species because of the use of the marine waters for research and private and commercial recreational purposes such as fishing, water skiing and sledding, jet skiing, and boat tour operations.

Large scale commercial or residential development is not planned in or near the vicinity of the He‘eia NERR. However, because of the existing high density of residential homes and the large amount of impervious surfaces in close proximity to the stream, fishpond, and Kāne‘ohe Bay, the waters of the He‘eia watershed are highly vulnerable to nonpoint source pollution including runoff.

1.7.2 Climate Change Impacts

As climate modeling and downscaling capabilities improve, projections for future climate change can be made with increased confidence. Although climate change impact projections for Kāne‘ohe Bay and the He‘eia region are not available, the following are climate change regional highlights for Hawai‘i and the

Pacific Islands observed over the twentieth century or are projected to occur at some time during or by the end of the twenty-first century. These results have been excerpted from *Global Climate Change Impacts in the United States* (GCRP 2009), the state of knowledge report issued by the U.S. Global Change Research Program.

- Warmer oceans are leading to increased coral bleaching events and disease outbreaks in coral reefs, as well as changed distribution patterns of tuna fisheries. Ocean acidification will reduce coral growth and health. Warming and acidification, combined with existing stresses, will strongly affect coral reef fish communities.
- Freshwater supplies are already constrained and will become more limited on many islands. Saltwater intrusion associated with sea level rise will reduce the quantity and quality of fresh water in coastal aquifers, especially on low islands. In areas where precipitation does not increase, freshwater supplies will be adversely affected as air temperature rises.
- Increasing temperatures, and in some areas reduced rainfall, will stress native Pacific Island plants and animals, especially in high-elevation ecosystems with increasing exposure to invasive species, increasing the risk of extinctions.
- Rising sea levels, coupled with high water levels caused by storms, will incrementally increase coastal flooding and erosion, damaging coastal ecosystems, infrastructure, and agriculture, and negatively affecting tourism.
- Mounting threats to food and water security, infrastructure, health, and safety are expected to lead to increasing human migration, making it increasingly difficult for Pacific Islanders to sustain the region's many unique customs, beliefs, and languages.

1.7.3 Reserve Sensitivity[7] and Vulnerability[8] to Climate Change

The *Climate Sensitivity of the National Estuarine Research Reserve System* (NOAA 2013) report examines some of the factors that make estuaries and the communities dependent on estuarine resources susceptible to climate change.

The report discusses how some estuaries may be much more vulnerable than others to the impacts of climate change. Scientists still do not fully understand which estuaries may be at greater risk or what the factors are which make some estuaries more susceptible to climate change than others. However, combining climate

[7] Sensitivity is a measure of whether and how a reserve or group of reserves is likely to be affected by both climate and non-climate stressors (NOAA 2013).
[8] Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. There are three components to vulnerability as the term is used in this report: sensitivity, resilience, and exposure (NOAA 2013).

change information across disciplines (e.g. social and biophysical) provided a much more holistic view than would have been offered by any one of these areas by itself.

The following key features of NOAA's (2013) study could better inform the future research on the sensitivity and vulnerability of He'eia NERR.

- All reserves will be impacted by climate change at some level, with all reserves having one or more indices rated as high (or very high).

- Social sensitivity is of particular concern along the West Coast and at isolated reserves in the Caribbean, Great Lakes, and Gulf of Mexico.

- Biophysical sensitivity is of highest relative concern at isolated reserves in the Southeast and on the West Coast. The relevance of biophysical sensitivities at each reserve will also be determined by the natural resource management objectives of that reserve.

- Sea level rise will be a concern across all regions, with slightly less impact predicted for the Northeast than for other regions.

- Temperature change exposure will be a concern over most regions, with the largest effects in the Great Lakes, Northeast and Mid-Atlantic.

- The climate change indicators do not all co-vary. This means that reserves will have to consider different climate change stressors in their climate change vulnerability assessments and plan management strategies accordingly.

- Comparison of indicators reveals several reserves with notable climate change sensitivity. In relative terms, the Tijuana River Reserve has the highest risk for climate change impacts when looking across all five indices. Waquoit Bay Reserve is also at high risk.

- A better understanding of climate change vulnerability at the individual reserve level will require reserve-specific analyses.

Some salient points related to integrated approaches that were learned through NOAA's study on reserve sensitivity and vulnerability and that could be applied at He'eia NERR include:

- Defining an approach, strategy, or research effort as integrated at the onset helps define expectations and roles, which leads to more coherent and collaborative integration.

- Integrated approaches need to include time for interdisciplinary learning. The language, methods, and concepts of disciplines are often different and, as a result, integrated projects create learning opportunities and enhance perspectives for all involved.

- Integration of data across disciplines can prove quite challenging; however, even when quantitative integration of data is not possible, qualitative integration can produce valuable results and important insights.

Section 2. Community Engagement Process

There was an extensive community engagement process that laid the foundation for the nomination and designation of the He‘eia NERR. The general public and in particular the site partners, along with OP and NOAA, were fully engaged throughout the development of the He‘eia NERR management plan.

2.1 Basis for Community Engagement

The foundation for community engagement was laid by the Ko‘olaupoko Hawaiian Civic Club (KHCC), which actively engaged not only the Hawaiian community but the larger community in activities involving Kāne‘ohe Bay and the upland areas. The KHCC represents the ahupua‘a of Kāne‘ohe, He‘eia, Kahalu‘u, Waihe‘e, Ka‘alaea, Waiāhole, Waikāne, Hakipu‘u, and Kualoa on the windward side on the island of O‘ahu. Included in that representation are families and kūpuna who have lineal and cultural connections to He‘eia. In addition to the KHCC’s work, for more than 10 years, HIMB has been working to involve the community in its research projects in Kāne‘ohe Bay (PBR Hawai‘i 2014). Community engagement has included education programs and tours of Moku o Lo‘e for individuals, families, and community and school groups. Other groups, like Paepae o He‘eia and Kako‘o ‘Ōiwi, have long been actively engaged in culturally restoring the He‘eia Fishpond and the lo‘i kalo, respectively, and have generated great interest and involvement by the larger community in these efforts.

2.2 Cultural Principles

The following principles were integrated into the community engagement process that informed the development of the management plan. These principles, while common to most cultures, are especially important in a Hawaiian context:

- Respect or mahalo: An essential principle in developing the management plan was the importance of asking permission before acting, and being grateful for the opportunity to discuss issues.
- Humility or ha‘aha‘a: Listening with attention, respect, and compassion was also critical.
- Thoughtfulness or no‘ono‘o: The management plan was developed thoughtfully and attempts to reflect the spirit and interests of the community.
- Propriety or pono: The management plan is guided by the principle of doing what is right.
- Responsibility or kuleana: The success of the management plan is dependent on everyone taking responsibility for being prepared for meetings, for their stewardship of resources, and for caring for each other.

2.3 Community and Government Partnerships

The site partners who have played a vital role in the designation of He‘eia as a NERR site are described below:

- Ko‘olaupoko Hawaiian Civic Club (KHCC): This group was first established in August 1937 by a group of kama‘āina residents from Kāne‘ohe. KHCC is a nonprofit civic and community organization dedicated to the perpetuation and preservation of native Hawaiian history, culture, and heritage (KHCC 2015).

- Ko‘olau Foundation: The Ko‘olau Foundation is a cultural heritage preservation program with a mission to promote Hawaiian cultural and environmental practices, preservation, and education. (KHCC 2015).

- Paepae o He‘eia: This is a private, nonprofit organization dedicated to caring for the He‘eia Fishpond. Established in 2001 by a group of young Hawaiians, Paepae o He‘eia works in partnership with the landowner Kamehameha Schools to manage and maintain He‘eia Fishpond for the community. Paepae o He‘eia was established to mālama (care for) He‘eia Fishpond and serve as kia‘i (guardian) to this precious resource and treasure (Paepae o He‘eia 2015).

- Kāko‘o ‘Ōiwi: As stated on its website, “Kāko‘o ‘Ōiwi is a community-based non-profit organization based in the ahupua‘a of He‘eia, moku of Ko‘olaupoko, island of O‘ahu. With the support of the local community, Kāko‘o ‘Ōiwi acquired a 38-year lease agreement with the State of Hawai‘i Community Development Authority (HCDA) to implement Māhuahua ‘Ai o Hoi (Re-growing the fruit of Hoi), a long-range project to restore agricultural and ecological productivity to nearly 405 acres within the wetlands of

He‘eia. Through their cultural, educational and ecosystem restoration programs, Kāko‘o ‘Ōiwi is promoting the social and economic advancement of the local community.” (Kāko‘o ‘Ōiwi 2015).

- Hawai‘i Institute of Marine Biology (HIMB): The mission of HIMB is to conduct multidisciplinary research and education in all aspects of tropical marine biology. HIMB continues to be a world leader in research to understand and conserve tropical marine ecosystems. HIMB develops and implements new technologies that advance the informed stewardship of Hawai‘i’s marine and coastal biodiversity. (HIMB 2015).

- Kama‘āina Kids: A private, nonprofit, multiservice organization dedicated to serving children and their families through quality childcare programs (Kama‘āina Kids 2015a). The organization’s services include preschool programs, before and after school programs, environmental education programs, and enrichment programs, many of which are offered at He‘eia State Park.

The two government agencies that have played an instrumental role in the designation of the He‘eia NERR are the following:

- State of Hawai‘i Office of Planning: The Office of Planning (OP) is administratively attached to the Department of Business, Economic Development and Tourism (DBEDT) and provides technical assistance and coordination among different agencies and levels of government to assist in the overall analysis and formulation of state policies and strategies to guide the future development of the state.

- National Oceanic and Atmospheric Administration (NOAA): NOAA was established in 1807. The agency’s scope of responsibilities encompasses weather forecasting, issuing severe storm warnings, monitoring climate, managing fisheries, restoring coasts, and supporting marine commerce. NOAA works to protect life and property and conserve and protect natural resources.

This group of site partners continued to work together as the He‘eia NERR Steering Committee to provide input on the development of the management plan and provide logistical and administrative support for the site designation process. The role of the Reserve Advisory Board (RAB) after designation is explained in Section 5.5.1.

2.4 Community Engagement Process and Methods

A deliberate attempt was made by OP to initiate a broad-based engagement process that would inform, listen to, and solicit as much input as possible that included the following:

Public Meetings On January 9, 2014 and February 27, 2014, public meetings were held in Kāneʻohe to take comments on the selection of Heʻeia as the preferred site for a NERR in Hawaiʻi. Public notices about the public meetings were published in Honolulu's leading newspaper, the Star Advertiser and NOAA published in the Federal Register the *Public Meeting on the Proposed Heeia Site for a National Estuarine Research Reserve in Hawaii* on January 28, 2014 (Appendix C). Appendix C provides attendance sheets and a full list of comments collected on the selection of Heʻeia as the preferred site for a NERR in Hawaiʻi.

Public Scoping Meetings On November 24, 2014 NOAA published in the Federal Register the *Intent to Prepare a Draft Environmental Impact Statement for the Proposed Heʻeia National Estuarine Research Reserve in Kāneʻohe Bay, Hawaiʻi* (Appendix C). A public notice about the scoping meetings was also published in Honolulu's leading newspaper, the Star Advertiser (Appendix C). The public notice invited interested parties to attend the two public meetings held on December 17, 2014 in Kāneʻohe, Hawaiʻi and on December 19, 2014 in Honolulu, Hawaiʻi, as well as to provide comments on the scope of the significant issues to be analyzed in the draft environmental impact statement (EIS) and the draft management plan. Appendix C provides public meeting agenda, attendance sheets and meeting notes.

- **First Series of Focus Group Meetings** In addition to the public scoping meetings, OP convened three focus groups on (1) Education, Training, and Interpretation; (2) Research and Monitoring; and (3) Public Outreach and Resource Management. These meetings engaged the community in a more targeted discussion of the strategic vision, mission, goals, objectives, and strategies for the Heʻeia NERR. The purpose of the focus group meetings was to gather input from the community on the Strategic Plan for the Heʻeia NERR management plan. Refer to Appendices D, E, and F for copies of the meeting agendas, meeting notes, and attendance sheets.

- **Second Series of Focus Group Meetings** To ensure that the Strategic Plan accurately reflected the community's mana'o (thoughts), a second series of focus group meetings was conducted to present a working draft of the He'eia NERR strategic vision, mission, goals, objectives and strategies to the community stakeholders. Appendix G includes the meeting agendas, meeting notes, and attendance sheets.
- **Steering Committee Meetings** After listening to the comments of the focus groups, OP revised the Strategic Plan to integrate the NERRS strategic plan guidelines and the unique values and activities in He'eia. Appendix H includes the Steering Committee meeting agenda.
- **KHCC Membership Meeting** Responding to a request by the KHCC, a presentation of the He'eia NERR designation process was given to its members.
- **Kāne'ohe Bay Regional Council Meeting** In order to update the Council regarding the He'eia NERR designation process, presentations were given to the Council.
- **Kahalu'u Neighborhood Board Meeting** Responding to a request by the Kahalu'u Neighborhood Board, a presentation of the He'eia NERR designation process was given to its members.
- **Website Outreach** OP regularly updates its website with project news, notices, and frequently asked questions (FAQs). Appendix I gives a summary of the FAQs and answers that have been posted on the OP website.

Section 3. Reserve Strategic Plan

The He‘eia NERR Strategic Plan provides a framework and direction for the He‘eia NERR over the next five years. The He‘eia NERR has several active site partners who have their own strategic plans (HIMB, Paepae o He‘eia, Kako‘o ‘Ōiwi, and KHCC) who are actively implementing those plans. While each site partner may have their own strategic plan, they all share a similar vision of honoring the past (traditional knowledge) and utilizing contemporary science and resources to restore a healthy resilient human and natural community within the ahupua‘a of He‘eia. It was this shared vision that brought them together to seek resources and a management structure that would have the ability to reach beyond their own geographic boundaries to develop a plan that integrated their activities into a cohesive plan. For the site partners, the He‘eia NERR provides that opportunity to effectively and efficiently collaborate and coordinate their respective activities to meet not only the goals and objectives of the He‘eia NERR but their own respective strategic plans as well.

It was apparent during the strategic planning process that a consistent theme was the importance of getting baseline data, inventorying the research that has already occurred within the area to avoid duplication and identify gaps in the research. Site partners all want to get a better understanding of each others’ activities. There is a need to determine the impacts on the ecosystem of the various restoration and manipulation activities occurring within the He‘eia NERR.

Thus, the He‘eia NERR Strategic Plan for the first five years is focused primarily on baseline information, monitoring, research, education, stewardship, and community engagement. Accordingly, the adaptive management approach of promoting a flexible plan that may be adjusted as information becomes available is especially well-suited for this early stage of the He‘eia NERR. Moreover, this approach is in alignment with the State’s CZM Priorities as well as NOAA’s priorities. This is a thoughtful and responsible course of action: to proceed with the implementation of the He‘eia NERR Strategic Plan with a focus on coordinated research and monitoring, education and stewardship, resource management, and financial prudence rather than initiating redundant and unaligned programs. There is support for the idea that as information becomes available, the management plan will be reassessed and adjusted accordingly.

3.1 Vision and Mission

A clear vision and mission, and guiding principles, create an essential foundation to a management plan. During Phase I of the NERR site selection process, the long-term benefits of establishing a NERR in Hawai‘i were recognized. During Phase II, the best site to provide those benefits was selected and incorporated into the nomination document. During Phase III, the focus groups, with input from the steering committee, developed the He‘eia NERR vision and mission as follows.

He‘eia NERR Vision

Ho‘ōla: The biological and cultural integrity of the ahupua‘a of He‘eia is restored to create an ‘āina momona (abundant) legacy for future generations. The ahupua‘a of He‘eia is a global example of thriving and resilient socioecological communities.

He‘eia NERR Mission

Kuleana (privilege and responsibility): To practice and promote responsible stewardship and outreach consistent through the principles and values of the ahupua‘a land management system. Our efforts will be supported by traditional knowledge, innovative research, education, and training that nourishes healthy and resilient ecosystems, economies, and communities.

This vision is a place-based, He‘eia-specific version of the national system’s vision: “Resilient estuaries and coastal watersheds where humans and nautral communities thrive.” The He‘eia NERR mission is a place-based version of the national system’s mission: “To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas.”

The He‘eia NERR’s primary research question frames the research goals and associated manipulation and restoration activities being undertaken at the site. The research goals are discussed in Section 4.1, manipulation activities in Section 10, and restoration activities in Section 11.

He‘eia NERR Primary Research Question

By measuring the suite of ecosystem services provided by two management strategies of contemporary ecological restoration and one that embraces traditional Native Hawaiian management practices, the He‘eia NERR intends to evaluate these approaches within the He‘eia NERR boundaries to create an integrated approach that makes the He‘eia NERR a model for EBM strategies for Pacific Island estuarine ecosystems.

3.2 Priority Coastal Management Issues

There are a number of priority coastal management issues for the He‘eia NERR. These issues include a number of natural processes and anthropogenic effects: invasive species, loss of habitat, erosion and sedimentation, nonpoint source pollution, urbanization and human activities in the area, water quality issues, agricultural development, and climate change impacts on the area. Invasive species, including algae and certain fish species in Kāne‘ohe Bay and mangrove, grass and other species on land, are crowding out native species. The loss of habitat for native species is a concern for many groups at the He‘eia NERR. Erosion and sedimentation affect He‘eia Stream, He‘eia Fishpond, and water further out into Kāne‘ohe Bay, choking fish and coral. Nonpoint source pollution from nearby urban and residential areas and its effects on water quality are also of great concern. Agricultural development is an important activity in the area which will have far-reaching impacts on the land and receiving waters, not to mention the species that inhabit the area. Finally, climate changes including drought, increased flooding, salt water intrusion or seal level rise, may affect the area, including the species the ecosystem supports. Understanding these issues and the effects these processes have on the ecosystem is a high priority for the He‘eia NERR.

These coastal management issues that are a high priority in He‘eia are also relevant to state and federal coastal priorities. In 2010, the National Ocean Council and the National Ocean Policy (NOP) were established by the President’s Executive Order 12547 as part of the Final Recommendations of the Interagency Ocean Policy Task Force (2010). National Priority Objectives (NPO) under the NOP were also established. In 2013, the State of Hawai‘i Office of Planning, CZM Program (OP-CZM) updated the Hawai‘i ORMP[9] and identified three perspectives which were consistent with the NPO. The He‘eia NERR

[9] The Vision statement adopted under the ORMP is as follows, “The vision for Hawai‘i’s ocean resources is a healthy, productive, and sustainable ocean ecosystem that fosters economic growth while preserving and protecting Hawai‘i’s values and needs.” The ORMP vision statement and the He‘eia NERR vision are consistent and in alignment.

priority coastal management issues and corresponding goals align with both the Federal NPO and the State ORMP, as illustrated in Table 3-1.

Table 3-1. National Objective, State Perspective and Local Goals and Priority Issues

NPO Objective	ORMP Perspective	He‘eia NERR Goal	He‘eia NERR Priority Issues
Ecosystem-Based Management Regional ecosystem protection and restoration	1. **Connecting Land and Sea:** ORMP adopts place-based management as a foundational principal, which applies to nearshore fisheries, coral reefs, sea grasses, and other resources. This goal addresses soil erosion and pollutant loads.	1. Increase our understanding of the effects of human activities and natural events to **improve informed decision making** affecting the He‘eia estuary, coastal ecosystems, and ultimately the entire ahupua‘a of He‘eia.	Invasive species, loss of habitat, water quality issues
Water quality and sustainable practices on land	2. **Preserving Our Ocean Heritage:** ORMP recognizes marine resources, coral reefs, the ocean economy, and the cultural heritage of the ocean as ways to promote a sustainable Hawai‘i.	2. Develop a place-based education and training program for the He‘eia NERR that **inspires and educates the community about estuaries, coastal ecosystems, and traditional Hawaiian practices**, such as lo‘i and loko i‘a, that mālama (nurture) these systems sustainably.	Water quality issues, erosion and sedimentation, nonpoint source pollution, urbanization and human activities in the area, agricultural development
Inform Decisions and Improve Understanding Coordinate and Support Resiliency and	3. **Promoting Collaboration and Stewardship:** ORMP aims to build capacity for community participation in resource management through education and	3. The He‘eia NERR will engage various communities to create opportunities for collaboration to practice and promote stewardship	Agricultural development, climate change

Adaptation to Climate Change and Ocean Acidification	outreach. Climate change adaptation is included.	that **sustains cultural, biological, and natural resources**.	

3.3 Goals and Objectives

The He‘eia NERR management plan has been organized with goals and objectives that are based on an adaptive management planning framework. The management plan includes tasks to coordinate activities and apply new and traditional knowledge learned and shared to manage the He‘eia NERR. The goals identified below are the long-term intentions of the He‘eia NERR and can be applied beyond the 5-year timeframe of this management plan. These goals, focusing on the He‘eia estuary, traditional knowledge, coastal resources, and issues, closely link to the NERRS program sectors of education, research and training, and stewardship. The listed objectives under each goal are statements that describe what the He‘eia NERR is intended to accomplish within the first 5 years.

In order to reach the goals of the He‘eia NERR, the primary research question (See third box under Section 3.1) frames the different ecosystem-based management strategies that will be implemented on the site. The strategies influence a broad array of services that contribute to a healthy and sustainable estuarine ecosystem in the face of ongoing anthropogenic impacts, and human use demands. The He‘eia NERR plans to examine the ecosystem services provided by two management strategies: (1) an approach based on contemporary ecological restoration techniques to increase native species biodiversity, ecological resilience, and ecosystem integrity; and (2) an approach that embraces traditional Native Hawaiian management practices to return the ecosystem to a state that was realized within the traditional ahupua‘a system. Both strategies seek to integrate the concerns of the environment, society, economy, and human institutions, but focus on different aspects of each.

3.3.1 Research and Monitoring

Goal 1

Increase our understanding of the effects of human activities and natural events to **improve informed decision making** affecting the He‘eia estuary, coastal ecosystems, and ultimately the entire ahupua‘a of He‘eia.

Objectives

1. Baseline environmental data informs researchers' understanding of the magnitude of changes in the various He‘eia ecosystems.
2. Coordinate independent research and monitoring efforts in the ahupua‘a.
3. Integrate traditional knowledge and research in the He‘eia NERR that will better reflect and inform community decision making toward creating a sustainable ecosystem.

3.3.2 Education

> **Goal 2**
>
> Develop a place-based education and training program for the He‘eia NERR that **inspires and educates the community about estuaries, coastal ecosystems, and traditional Hawaiian practices**, such as lo‘i and loko i‘a, that mālama (nurture) these systems sustainably.

Objectives

4. Increase student, educator, and community understanding of estuaries in general and in particular Hawaiian estuaries, coastal habitats, and the ahupua‘a land management system.
5. Provide a comprehensive framework to integrate and enhance coordination and effectiveness of place-based education and training programs that have been initiated independently by the He‘eia community.

3.3.3 Stewardship

> **Goal 3**
>
> The He‘eia NERR will engage various communities to create opportunities for collaboration to practice and promote stewardship that **sustains cultural, biological, and natural resources**.

Objectives

6. Integrate traditional knowledge and contemporary science to effectively address climate change, habitat restoration, and water quality.

7. Engage and educate the community on the practices and values of the ahupua‘a land management system; in other words, promote ‘āina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.
8. Become a leading repository of information for cultural, biological, and natural resources in the He‘eia estuary.
9. Develop the tools, capacity and connections to increase public awareness across the community, island, state, nation, and the world of the ecological and cultural significance of the He‘eia estuary and ultimately the entire ahupua‘a of He‘eia.
10. Support restoration of key areas in the He‘eia NERR to improve habitat and increase ecosystem services.

3.4 Strategies

For each of the above objectives, this management plan sets forth strategies to provide guidance on clear actions that could be taken to fulfill the goals and objectives. Each strategy is linked to a proposed outcome that can be used to measure progress or success in accomplishing the strategy and, subsequently, the corresponding objective and goal. These strategies and proposed outcomes are discussed in Section 4, “Reserve System Program Foundations.”

Section 4. Reserve System Program Foundations

4.1 Research and Monitoring Program

4.1.1 NERRS Research and Monitoring Program

The NERRS's mission provides that reserves are protected and managed to afford opportunities for long-term research. Research at each reserve is designed to fulfill the Reserve System goals as defined in the regulations (15 CFR 921[b]):

- Address coastal management issues identified as significant through coordinated estuarine research within the system.
- Promote federal, state, public and private use of one or more reserves within the system when such entities conduct estuarine research.
- Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

To sustain these system goals, the *2011–2016 Reserve System Strategic Plan* outlines research objectives that support the focus areas of climate change, habitat protection, and water quality:

- Expand capacity to monitor changes in water quality and quantity, habitat, and biological indicators in response to land use and climate change drivers.
- Improve understanding of the effects of climate change and coastal pollution on estuarine and coastal ecology, ecosystem processes, and habitat function.
- Characterize coastal watersheds and estuary ecosystems and quantify ecosystem services to support ecosystem-based management of natural and built communities.
- Increase social science research and use of social information to foster coastal stewards that value and protect estuaries.

The reserve system's research and monitoring programs provide the scientific basis for addressing coastal management challenges. Reserve research and monitoring activities provide valuable information about estuarine resources to increase understanding and awareness of their importance to a variety of audiences including scientists, resource managers, educators, and the general public.

4.1.1.1 Reserve System Research Programs

Currently, there is one focused effort to fund estuarine research in the reserve system. The National Estuarine Research Reserve System Science Collaborative (Science Collaborative) is a program that focuses on integrating science into the management of coastal natural resources. Through an adaptively managed program, the Science Collaborative funds collaborative research and science transfer programs and projects that develop and apply science-based tools to better understand how to detect, prevent, and reverse the impacts of coastal pollution, habitat degradation and ecosystem processes in a time of climate change. The program is designed to enhance the Reserve System's ability to support decisions related to coastal resources through collaborative approaches that engages the people who produce science and technology with those who need it. In so doing, the Science Collaborative seeks to make the process of linking science to coastal management decisions, practices, and policies more efficient, timely, and effective and share best practices and examples for how this can be done.

4.1.1.2 Reserve System-Wide Monitoring Program

The SWMP provides standardized data on national estuarine environmental trends while allowing the flexibility to assess coastal management issues of regional or local concern and is guided by the Reserve SWMP Plan. The principal mission of the monitoring program is to develop quantitative measurements of short-term variability and long-term changes in water quality, biological systems, and land use/land cover characteristics of estuaries and estuarine ecosystems for the purposes of informing effective coastal zone management. The program is designed to enhance the value and vision of the reserves as a system of national references sites and focuses on three ecosystem characteristics:

1. **Abiotic Characteristics:** Abiotic measurements are supported by standard protocols, parameters, and approaches that describe the physical environment including weather, water quality, hydrological, and sediment related parameters. The monitoring program currently provides data on water temperature, specific conductivity, percent saturation of dissolved oxygen, pressure, pH, turbidity, salinity, concentration of dissolved oxygen, and pressure corrected water depth. Meteorological data include air temperature, relative humidity, barometric pressure, wind speed, wind direction, rainfall, and photosynthetically active radiation (PAR). In addition, the program collects monthly nutrient and chlorophyll A samples and monthly diel samples at one SWMP data logger station. Data is Federal Geographical Data Committee-compliant and available via the Reserve System Centralized Data Management Office.

2. **Biotic Characteristics:** As funds are available, reserves are focusing on monitoring habitats and biodiversity.

3. **Watershed and Land Use Classifications:** The reserve system is examining the link between watershed land use and coastal habitat quality by tracking and evaluating changes in coastal habitats

and watershed land use/cover. This element is guided by the Reserve System Habitat Mapping and Change Plan.

Building on these foundational elements, the reserve system is developing a network of sentinel sites and the capacity to assess the impact of sea level/lake level changes and inundation on the diverse set of coastal vegetative habitats represented in the system. Reserves are implementing a suite of activities, as described in the 2012 Reserve System Sentinel Site Guidance Document, to assess the relationship between vegetative communities (marsh, mangrove and submerged aquatic vegetation) and sea level. Reserves are adding surface elevation tables and monitoring pore water chemistry along vegetation monitoring transects and linking their SWMP to a network of specialized spatial infrastructure to allow precise measurement of local sea level and lake level changes and subsequent impacts to key habitats. The reserve system is working in partnership with NOAA's National Geodetic Survey and the Center for Operational Oceanographic Products and Services to support the development of sentinel sites.

4.1.2 He'eia NERR Research and Monitoring Program Context

Continued global decline of marine resources highlights that conventional management approaches simply cannot meet the challenges facing coastal ecosystems today (McLeod & Leslie 2009). Ecosystem-based management (EBM) is a long-term, integrated management approach that recognizes humans are a necessary part of and have significant influences on their environments. EBM embodies a fundamental shift away from ineffective conventional management paradigms that are frequently short term, reactionary, suffer jurisdictional limitations, and consider humans to be independent of nature and inconsistent with conservation goals (McLeod & Leslie 2009). As such, EBM advocates argue for a new holistic, resilience-based approach to oceans management, which has been heralded as "a critical new course for marine management" (Science 2009). Among Pacific Islanders, however, EBM is far closer to the traditional management system practiced for centuries prior to Western contact than are conventional management practices or contemporary restoration strategies.

The resource management system of ancient Hawai'i was based on the fact that all lands and natural resources were held in trust by the ali'i (chiefs) with harvest rights carefully overseen by a konohiki (expert resource manager) who was responsible (with their life) for the coordinated stewardship of all natural resources and extractive activities under their domain (the ahupua'a). The ahupua'a system constituted a carefully regulated and sustainable management strategy that integrated watershed, freshwater and nearshore marine resources based on the fundamental linkages between all ecosystems from the peaks of the mountain to the horizon of the sea (reviewed by Jokiel et al. 2010). Under this system, Native Hawaiians are one of the few societies documented to live entirely sustainably for centuries (off the local resources without any external subsidy), and were able to support a population of up to a million people, without any appreciable decline in marine resources when managed carefully (Kirch 1985; Kittinger et al. 2011). In contrast, a population of 1.3 million people today in the state gets over 90% of food from importation, and

many argue could not survive for more than a few weeks without that subsidy (Jokiel et al. 2010). It is important to emphasize the "carefully managed" caveat, because there are accounts of periodic famine, such as a "severe deficiency of fish" (Ellis 2004) indicating that resources have always been sensitive to overexploitation if not managed properly.

Thus, the movement towards EBM is particularly welcome and familiar among Pacific Islanders. The question remains how best to implement this strategy, and what exactly constitutes EBM as an explicit adaptive management strategy to maximize resilience and sustainability of ecosystem services desired by all stakeholders. The basic premises of EBM are to: 1) prioritize the health and function of the entire ecosystem over the needs of any individual activity or special interest group; 2) be place-based with natural boundaries; 3) account for multiple interactions, and how human actions both within and outside the place can influence or be influenced by management; 4) integrate the concerns of the environment, society, economy and human institutions; 5) consider humans as part of the system and maintain access to cultural ecosystem services demanded by people; and 6) provide a mechanism for coordination among all responsible entities (McLeod & Leslie 2009). Despite widespread consensus on the general tenets of EBM, the specifics of the approach, and the ability to implement EBM, remain a considerable challenge (Levin & Möllmann 2015; Prellezo & Curtin 2015).

He'eia NERR has an unprecedented ability to contribute to this ongoing debate about EBM best management practices, because the konohiki lineage responsible for sustainable management for over two centuries before Western contact still exists. That is, the descendants of the konohiki lineage are active in resource management decisions in the ahupua'a today. Thus, He'eia NERR seeks to provide a unique perspective on how different ecosystem-based management strategies influence a broad array of services that contribute to a healthy and sustainable estuarine ecosystem in the face of ongoing anthropogenic impacts, and human use demands. The He'eia NERR plans to examine the ecosystem services provided by two management strategies: (1) an approach based on contemporary ecological restoration techniques to increase native species biodiversity, ecological resilience, and ecosystem integrity; and (2) an approach that embraces traditional Native Hawaiian management practices to return the ecosystem to a state that was realized within the traditional ahupua'a system. Both strategies seek to integrate the concerns of the environment, society, economy, and human institutions, but focus on different aspects of each.

The first management strategy of ecological restoration is typical of contemporary conservation projects where the primary goal is to restore a damaged or degraded ecosystem to its historical trajectory by using pre-human conditions as the starting point for restoration design (SER 2004). This is a generally accepted approach that is advocated by most federal and state agencies, and is on a continuum of EBM approaches with an emphasis on ecosystem recovery (SER 2004).

The second management strategy based on the ahupua‘a system is an EBM approach successfully employed by Native Hawaiian cultural practitioners in He‘eia for at least 600 years prior to Western contact. Its essential premise is to care for the land and water so that it can in turn care for human sustenance (Jokiel et al. 2010; Bahr et al. 2015).

By measuring the suite of ecosystem services provided by each management strategy, the He‘eia NERR intends to evaluate these approaches within the He‘eia NERR boundaries to create an integrated approach that makes the He‘eia NERR a model for EBM strategies for Pacific Island estuarine ecosystems.

4.1.3 He‘eia NERR Research and Monitoring Program Capacity

The University of Hawaii’s HIMB is the managing state partner for the He‘eia NERR program. HIMB is also the main organization that has been conducting ecological research and monitoring in Kāne‘ohe Bay since its establishment in 1951 (HIMB 2015). HIMB is directed by its Strategic Plan (HIMB 2010) to be a world-class center for research on tropical marine ecosystems. From its research on large marine predators to the microbial foundations of estuarine and marine communities, HIMB is building a knowledge base that starts with relevant science, integrates public outreach, and concludes with providing recommendations for prudent management of coastal ecosystems.

Located on Moku o Lo‘e, HIMB is surrounded by 64 acres of coral reef designated by the State of Hawai‘i as the Hawai‘i Marine Laboratory Refuge which is used for research activities only. HIMB offers cutting edge research facilities for faculty, students, and visiting scientists. Research that HIMB is conducting in Kāne‘ohe Bay covers a broad range of topics, such as coral bleaching and disease, symbiosis, ocean acidification, marine microbial ecology, fisheries and top predator research, aquaculture and fish physiology, and biogeochemistry and biophysical analysis of reef systems.

HIMB’s efforts to engage the local community in research activities is in line with the research and monitoring goals and objectives developed for the He‘eia NERR. For example, HIMB maintains a database, accessible to the community, on the results of research conducted annually through its Pauley Program (workshops and short courses organized annually at HIMB) since 1983.

In addition to being one of the most intensively studied estuarine coral reef ecosystems on the planet (Bahr et al. 2016), the extensive history of study has already been compiled and made publically available through the Kāne‘ohe Bay Information System (KBIS - https://sites.google.com/site/kbisathimb/) as the foundation for the future Site Profile. Currently, the Hawai‘i Department of Health monitors water quality in He‘eia Stream and reports every 2 years on various water quality parameters such as total nitrogen, total phosphorous, total suspended solids, and turbidity. Additionally, many researchers at HIMB and on the main campus of UH at Mānoa have established and ongoing projects that can be leveraged by the establishment of the He‘eia NERR Research and Monitoring program such as:

Henrietta Dulai (University of Hawai‘i at Mānoa): interested in water availability throughout the watershed, Dr. Dulai has worked on surface water and groundwater resources, their quality and quantity for the past several years. Her future interests include:

- expected changes in the water budget with climate change and sea level rise - seawater intrusion to the coastal aquifer, lower precipitation rates resulting in less water availability
- expected changes in the water budget and water quality with land use change - conversion of the coastal wetland to taro will change terrestrial as well as marine water quality
- water as a pathway that connects terrestrial and fishpond/reef environments - stream and groundwater discharge to the coast, their relative importance for nutrient and sediment transport, are asks whether other emerging concerns such as pesticides, pharmaceuticals or other water-borne pollutants important?

Kathleen Ruttenberg & Margaret McManus (University of Hawai‘i at Mānoa): often working in collaboration, these researchers are interested in the way in which the magnitude and nature of fluxes of both sediment and nutrients (nutrients, carbon, DO, pH, etc.) throughout the watershed will change under differing land-use practices and resource management strategies. Prof. Ruttenberg also has a time series of biogeochemical parameters going back to 2007 that provides an invaluable baseline against which future changes can be measured. Their future interests include:

- time series of water and sediment flux, the associated dissolved and particulate chemistry, and the processes that control nutrient cycling in this system
- characterizing the nature of sediment and quantifying nutrient fluxes between the seabed and water column
- characterizing the nature of organic matter delivered across the ahupua‘a
- characterizing the impact of invasive alien macroalgae and mangrove removal on the benthic environment and nutrient biogeochemistry of the area

Flo Thomas & Sherril Leon-Soon (Hawai‘i Institute of Marine Biology): interested in the interaction of physics and biology, Dr. Thomas and her student Sherril have been collaborating with others on this list to look at the fluxes and fate of nutrients throughout the watershed, which species are using them, and trying to understand how traditional management practices such as taro patches (lo‘i kalo) and fishponds (loko i‘a) modify the flux of nutrients and sediment contained in the water that travels through the wetlands and out onto the reef flats. Further, **Hokulani Aikau** and others have collaborated with these researchers to provide information gathered by conducting interviews with keepers of knowledge (kupuna) to map historical land and resource uses.

Craig Nelson (University of Hawai‘i at Mānoa): is interested primarily in microbial activity and microbial community dynamics and how these impact environmental geochemistry and cycling of dissolved organic matter. His current research, supported by a competitive grant awarded through Hawaii Sea Grant, seeks to use microbial source tracking to understand the location and passage of wastewater seeps from cesspools in the surrounding inhabited area throughout the watershed. His future interests revolve around supporting a more holistic "ridge to reef" framework to understand the biogeochemistry of the system in collaboration with the other researchers listed in this section.

Mike Rappe (Hawai‘i Institute of Marine Biology): focuses primarily on anthropogenic and environmental forcing on microbial community structure across the bay. His current research, supported by a grant from the National Science Foundation (NSF) to work on population genetics and genome dynamics of planktonic marine microbes throughout the greater Kāne‘ohe Bay watershed. This funded project includes time series sampling for a number of water column parameters that will be of relevance and provide a baseline to future monitoring efforts in He‘eia NERR.

Brian Glazer (University of Hawai‘i at Mānoa): interested in the various biogeochemical processes (such as seasonal nutrient loading, sediment-water interface fluxes, and the scales of temporal/spatial variability in such processes) he is currently funded by NSF to deploy a miniaturized sensor array across the proposed He‘eia NERR. Specifically, his group has developed accurate, precise, and near-real-time remote sensing instruments that can provide data on biologically relevant scales that may contribute to national SWMP goals.

Erik Franklin (Hawai‘i Institute of Marine Biology): interested primarily in examining ecological structure, function, and interactions of organisms throughout the proposed He‘eia NERR site. Research to date has focused on species that are critical components for ecological function or food production as either target species or predators, prey, or competitors of target species. Future interests include ecological surveys to understand community composition, population dynamics, and migration into and out of the fishpond as well as life history analyses to understand growth and reproduction of target species inside the fishpond and as a result of changing land-use and resource management strategies within the site.

Rob Toonen, Brian Bowen & Steve Karl (Hawai‘i Institute of Marine Biology): often collaborating, this group is interested primarily in population and conservation genetics, connectivity, selection and local adaptation. Their work to date has shown that dispersal occurs at a much finer scale than previously assumed, and that population structuring of most coral reef species is at a scale of island-by-island or less. Their ongoing and future work seeks to quantify the amount of exchange from within the proposed He‘eia NERR site to the surrounding waters, and between Kāne‘ohe Bay and other sites along the windward coast of O‘ahu.

Paul Jokiel, Ku‘ulei Rogers & John Stimson (Hawai‘i Institute of Marine Biology): the ongoing Coral Reef Assessment and Monitoring Program (CRAMP) provides data from permanent coral monitoring sites established around the bay going back to 1997. This long-term monitoring can be integrated with the He‘eia

NERR efforts and continued to provide nearly 20 years of critical baseline data prior to establishment of the site. Valuable contributions of this prior work include documented past bleaching events, alien algae outbreaks, freshwater kills and other major disturbances to the reef communities of Kāneʻohe Bay and provide a rich context against which to assess changes under the proposed resource management strategies. In addition to this rich historical dataset, this group has also worked to reconstructed long-term historical baselines of the proposed site, documented ecological and community changes in the bay communities through time, worked on the integration of western science with traditional ways of knowing, and developed conceptual and mathematical models for predictions of expected changes to coral reef ecosystems in Hawaiʻi under future climate change.

Kim Falinski (The Nature Conservancy): a recent graduate of the University of Hawaiʻi at Mānoa, Dr. Falinski is primarily interested in sediment and nutrient retention of the wetland under contemporary and traditional management strategies. Her future research interests include the role of taro ponds (loʻi kalo) in sediment and nutrient retention, as well as their potential role in flood mitigation, food security and as habitat for endemic and endangered species.

Other relevant ongoing research efforts in the Heʻeia NERR include those conducted by UH, State and Federal agencies (detailed in the Heʻeia Resilient Lands and Waters Initiative document compiled by the Pacific Islands Climate Change Cooperative, NOAA Sentinel Site Program, and U.S. Environmental Protection Agency). This list provides an idea of the scope and breadth of research currently underway and the capacity available to the site. Additionally, the University of Hawaiʻi has the School of Ocean and Earth Science and Technology (SOEST) Laboratory for Analytical Biogeochemistry (S-LAB) measures dissolved inorganic and organic nutrients (P, N, Si); dissolved organic and inorganic carbon; dissolved oxygen; salinity; solid-phase carbon, nitrogen, sulfur and phosphorus; and chlorophyll-a in natural waters, sediments, soils, and vegetation that may contribute to the NERRS SWMP data. The in-house S-LAB provides analysis services at a reasonable per sample cost, as well as access to several instruments for user-based sample analysis (http://www.soest.hawaii.edu/S-LAB/) will provide an essential service to the site upon establishment of the SWMP plan.

4.1.4 Heʻeia NERR Research and Monitoring Program Research and Delivery Plan

Over the next 5 years, the Heʻeia NERR's Research Coordinator will provide the program support to begin a comprehensive and integrated research and monitoring program at Heʻeia NERR to meet the following research and monitoring program goal and objectives using the framework outlined below.

We propose to address the question of the ecosystem services that each management strategy provides in the framework of a coupled Social-Ecological System (SES), or a human-dominated anthroposystem, that explicitly considers the linkages between social system structural traits, human activities, ecosystem services, and human well-being in coastal communities (inset from Kittinger et al. 2012). Within this evaluation framework, we expect that contemporary and traditional Hawaiian approaches will each support multiple and different ecosystem services. Success of each can be evaluated using subsets of a continuum

of ecosytem services, not only in the context of the He‘eia NERR being restored to a more resilient and sustainable state, but also to increase our understanding of how different strategies for ecosystem based management (EBM) can be employed in other similar ecosystems within the SES framework.

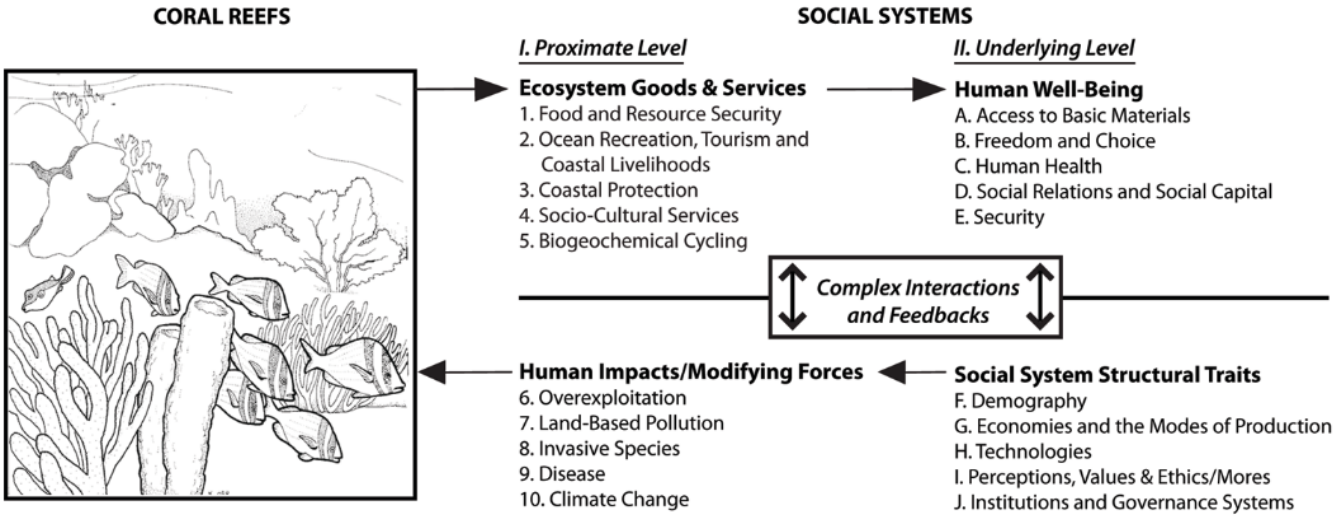

Figure 4.1. Illustration from Kittinger et al. 2012

4.1.5 Research and Monitoring Future Needs and Opportunities

During focus group meetings (See Section 2 on Community Engagement) the site partners identified the following research needs for the He‘eia NERR:

- Establish baseline environmental conditions of the ahupua‘a of He‘eia that can then guide future research and monitoring efforts at He‘eia NERR.
- Incorporate traditional Hawaiian knowledge and practices to inform and establish baseline environmental conditions.
- Conduct research that promotes our understanding of the interconnectedness of the ecosystems (from the mountains to the ocean) in the ahuapua‘a of He‘eia (See Section 4.1 on current research in the area).
- Develop a system to coordinate various independent social, cultural, and natural resource related research and monitoring conducted in the ahupua‘a of He‘eia so as to avoid duplication of effort and better guide future research needs.

- Contribute to and learn from the larger national and international community about climate change impacts and adaptations.

These ideas were the initial basis for the research and monitoring objectives developed for the management plan. Designation of the He‘eia NERR is viewed by the site partners as an opportunity to provide a framework to enhance coordination for the various ongoing as well as future research and monitoring needs in the ahupua‘a of He‘eia. Local cultural and scientific expertise and existing research facilities not just at HIMB but, also those at the site partners’ locations such as He‘eia Fishpond and the He‘eia CDD would be available to support and grow the He‘eia NERR research program. Over the next 5 years, the He‘eia NERR’s Research Coordinator will provide the program support to begin a comprehensive and integrated research and monitoring program at He‘eia NERR to meet the following research and monitoring program goal, objectives, and strategies.

Figure 4-2. Hawai‘i Institute of Marine Biology (HIMB) on

Moku o Lo‘e

(Photo courtesy of HIMB)

Goal 1

Increase our understanding of the effects of human activities and natural events to **improve informed decision making** affecting the He‘eia estuary, coastal ecosystems, and ultimately the entire ahupua‘a of He‘eia.

Objective 1 Baseline environmental data informs researchers' understanding of the magnitude of changes in the various Heʻeia ecosystems.	
Strategies to meet Objective 1	**Outcomes**
Strategy 1(a): Document cultural and archaeological information to establish historical and baseline conditions in the ahupuaʻa of Heʻeia, including the waters of Kāneʻohe Bay	Ethnographic interviews with kūpuna document what they considered an optimal and healthy state of Kāneʻohe Bay and the ahupuaʻa of Heʻeia. The ethnograhic and historical data for the Heʻeia area inform research.
Strategy 1(b): Explore the development of a reserve-specific repository to house historical, cultural, and scientific information conducted in Heʻeia.	Heʻeia historical, cultural, and scientific data and information are compiled and available digitally for internal and external users.
Strategy 1(c): Heʻeia NERR staff will identify the gap areas that need additional research.	Researchers at the Heʻeia NERR shall be informed of other research being conducted in the area and possible synergies and data gaps.
Strategy 1(d): Heʻeia NERR staff and partners develop a site profile for the Heʻeia NERR by collecting relevant information.	By 2019, a completed site profile is provided to NOAA OCM and interested researchers. Heʻeia NERR shall have a complete and approved site profile.
Strategy 1(e): Support research studies on how floodwaters, sediment, and nutrients move through the ahupuaʻa of Heʻeia.	Researchers and coastal managers have an improved understanding of how water, sediment, and nutrients movement studies in the through the ahupuaʻa of Heʻeia are conducted.
Strategy 1(f): Create opportunities to conduct research within the ahupuaʻa, potentially outside the Heʻeia NERR boundaries, that provides relevant information about impacts on the entire ahupuaʻa of Heʻeia, to inform the long-term vision of a healthy Heʻeia ahupuaʻa.	The long-term vision of the Heʻeia ahupuaʻa is informed by research conducted within the ahupuaʻa.
Strategy 1(g): Conduct scientific research and monitoring that will provide information on climate change, water quality, estuary habitat change, and other topics of local and national interest and significance.	Information on topics of local and national interest and significance shall be developed from research and monitoring conducted in the Heʻeia NERR.
Strategy 1(h): Establish 4 water quality SWMP stations and 1 weather station.	Heʻeia NERR SWMP data contributes to local understanding of changes in the Heʻeia ecosystem. By 2018, Heʻeia NERR SWMP program is integrated with the national monitoring program (i.e. NERRS, NOAA Sentinel Sites and IOOS).
Strategy 1(i): Implement baseline biodiversity surveys with Heʻeia NERR site partners.	Comprehensive biological survey data informs Heʻeia NERR site profile and is available to use by researchers.

Strategy 1(j): Establish a site experimental design that supports ecosystem-based management research approach.	Treatment and control areas are identified within each major ecosystem type for the He‘eia NERR.
Strategy 1(k): Recruit and maintain reserve research and monitoring staff.	Staff are supporting the development and implementation of He‘eia NERR research programs.

Objective 2 Coordinate independent research and monitoring efforts in the ahupua‘a.	
Strategies to meet Objective 2	**Outcomes**
Strategy 2(a): Develop a comprehensive long-term environmental monitoring program for He‘eia NERR in upland, estuarine, and marine ecosystems.	Researchers and partners improve their understanding of short and long-term changes within the He‘eia ahupuaa.
Strategy 2(b): He‘eia NERR staff coordinates implementation of the He‘eia NERR monitoring program with site partners.	The He‘eia NERR monitoring programs are linked to local monitoring efforts.
Strategy 2(c): Facilitate the coordination, collaboration, and distribution of all scientific investigations conducted within the ahupua‘a of He‘eia (to the extent legally permissible) to minimize duplication of research and identify the gap areas that need additional research.	Researchers at the He‘eia NERR shall be informed of other research being conducted in the area and possible synergies and data gaps.
Strategy 2(d): Recruit and maintain He‘eia NERR research and monitoring staff.	Staff support He‘eia NERR implementation of SWMP and other key terrestrial and marine monitoring efforts.
Strategy 2(e): Collaborate with new partners conducting relevant research and monitoring efforts	New external partnerships are established.

Objective 3 Integrate traditional knowledge and research in the He‘eia NERR that will better reflect and inform community decision making toward creating a sustainable ecosystem.	
Strategies to meet Objective 3	**Outcomes**
Strategy 3(a): Create opportunities for Native Hawaiian practitioners, scientists, (including those with expertise in traditional and customary practices) and others (including those with expertise in contemporary science) to collaborate and develop contemporary mo‘olelo (stories) reflecting change that reflect and track changes in the He‘eia ahupua‘a over time.	Contemporary mo‘olelo for He‘eia ahupua‘a inform the collective understanding of recent changes within the ahupua‘a.
Strategy 3(b): Coordinate periodic community meetings to inform the community about upcoming scientific research opportunities, gather input to guide further research, and share ongoing research results.	At least 2 local communities are knowledgeable of the ongoing and planned research within the He‘eia NERR.
Strategy 3(c): Work with site partners to share ecosystem-based best management practices that support improved management of the He’eia ahupua’a.	Ecosystem-based best management practices are applied by communities to improve coastal ecosystems.
Strategy 3(d): Creates opportunities for the “synthesizers” or “bridgers”[10] of traditional customary practices and contemporary science to collaborate and share their findings and recommendations.	Site partners and the community are knowledgeable of the synthesizers’ mana‘o about the nexus of traditional practices and contemporary science.
Strategy 3(e): Recruit and maintain He‘eia NERR educational and cultural staff.	Staff are supporting the integration of traditional knowledge and scientific research in the He’eia NERR.

10 “*Synthesizers/bridgers” are defined as individuals who apply different ways of knowing including traditional practices and contemporary science within the context of the He’eia NERR.*

4.2 Education Program

4.2.1 NERRS Education Program

The NERRS mission includes an emphasis on education, interpretation, and outreach. Education at each reserve is designed to fulfill the Reserve System goals as defined in the regulations (15 CFR 921[b]):

- Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation.
- Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

To sustain these system goals, the *2011-2016 Reserve System Strategic Plan* outlines education objectives that support the focus areas of climate change, habitat protection, and water quality:

- Enhance the capacity and skills of teachers and students to understand and use reserve system data and information for inquiry-based learning.
- Increase estuary literacy and promote active stewardship among public audiences through the development and delivery of tools and programs addressing climate change, habitat protection, and water quality.

The reserve system provides a vehicle to increase understanding and awareness of estuarine systems and improve decision-making among key audiences to promote stewardship of the nation's coastal resources. Education and interpretation incorporate science-based content into a range of programs and methodologies that are systematically tailored to key audiences around priority coastal resource issues.

Reserves conduct formal and informal education activities, as well as outreach activities that target culturally diverse audiences of educators and students, environmental professionals, resource users, and the general public. Education and public programs, interpretive exhibits and community outreach programs integrate elements of reserve system science, research, and monitoring activities and ensure a systematic, multifaceted, and locally focused approach to fostering stewardship.

The reserve system is committed to preparing tomorrow's future leaders with the knowledge and understanding of our nation's oceans and coasts to be responsible stewards. To fulfill this commitment, the Reserve System has created the K-12 Estuarine Education Program (KEEP) to increase the estuary literacy of students, teachers and the general public. The KEEP helps students and teachers learn about essential coastal and estuarine concepts, develop data literacy skills and strengthen their critical thinking, team building, and problem-solving skills. K-12 and professional development programs for teachers include the

use of established coastal and estuarine science curricula aligned with state and national science education standards and frequently involve both on-site and in-school follow-up activity.

Community education is another priority for the reserve system. Community education programs foster behavioral change to promote resource conservation. These programs work with audiences whose choices directly impact the integrity of our estuaries and their associated watersheds.

4.2.2 He‘eia NERR Education, Training, and Interpretation Program Context

Several academic and community-based educational programs have been and continue to be organized in He‘eia, independent of the nomination of He‘eia NERR. The following paragraphs describe some of the education, training, and interpretive programs routinely organized by some of the He‘eia NERR site partners such as HIMB, Paepae o He‘eia, and Kāko‘o ‘Ōiwi.

HIMB, as mentioned above, is a research institute at UH at Mānoa. Housed in the University’s School of Ocean and Earth Science and Technology (SOEST), HIMB offers a variety of undergraduate and graduate courses, seminars, and research opportunities for undergraduate and graduate students in marine and estuarine sciences. In addition to its academic programs, HIMB offers educational programs to individuals, families, and school (K-12) and community groups. These include science inquiry programs for high school students; various teacher workshops, guided walking tours of Moku o Lo‘e that describe the island’s natural and human history; the Expedition to Moku o Lo‘e — a 3-hour program during which members of the community can be part of a marine biology research team on the water and in the lab; and Moku o Lo‘e Marine Science Overnights, in which the community and youth groups participate in data collection and hypothesis building activities while staying at the field station. HIMB also organizes community and citizen science research programs with partners in the ahupua‘a, at locations such as He‘eia Fishpond and wetlands. HIMB thus provides a full spectrum of formal and informal educational opportunities for all types of participants along the learning continuum. A central mission is to create pathways to marine science research and management careers for students from Hawai‘i school systems.

Paepae o He‘eia runs the Ka ‘Ai Kamaha‘o program, which engages participants from the community, “keiki to kūpuna, in culturally relevant and academically rigorous studies aimed at bridging traditional and contemporary knowledge systems. The eco-cultural projects consist of mālama loko i‘a, place-based knowledge and ecological-based studies that foster values and concepts of traditional fishpond management” (Paepae o He‘eia 2015). Through its He‘eia Ahupua‘a Internship program, Paepae o He‘eia offers a unique opportunity to youth and young adults to work outdoors and learn the science and skills to restore, preserve, and protect not just the fishpond but the entire mauka/makai ahupua‘a relationship.

Figure 4-3. High school students learn from transect surveys of reefs at HIMB's summer internship program

(Photo courtesy of Hawai'i Institute of Marine Biology)

Paepae o He'eia also organizes educational field programs for K-12 and college students. For example, Paepae o He'eia has partnered with several Hawaiian-based charter schools. Students from these schools use the fishpond as a classroom and a living lab, examine the ecology of the fishpond and estuarine environments, and develop a deeper understanding of how the fishpond works. A variety of other schools in the State's Department of Education system also participate in Paepae o He'eia's education activities and learn about the ecology of coastal ecosystems, the estuarine environment, and Hawaiian fishponds. The Center for Hawaiian Studies at UH offers the Mālama Loko I'a course, during which students meet at the fishpond every week to learn about traditional fishpond management and gain hands-on experience. The students' work helps inform management decisions that Paepae o He'eia makes regarding restoration and fish and limu culture.

Figure 4-4. K-12 students participate in educational activities at the He'eia Fishpond

(Photos courtesy of Paepae o He'eia)

Kākoʻo ʻŌiwi implements the Māhuahua ʻAi o Hoi (Re-growing the fruit of Hoi), a long-range project to restore agricultural and ecological productivity to nearly 405 acres within the wetlands of Heʻeia. The group organizes monthly community workdays that involve activities like weeding, maintaining existing loʻi kalo, building new loʻi kalo and ʻauwai (irrigation ditches), and clearing invasive vegetation. Through these activities, participants learn the ecological and cultural foundations of traditional Hawaiian agriculture and how upland activities affect the estuary and bay waters.

The educational programs at Heʻeia NERR complement the national priorities of ecosystem-based management and ecosystem protection and restoration—the sustainable practices on land, the nearshore marine environment, and at the fishpond in Heʻeia are the basis for educational programs highlighting the importance of the entire ecosystem. These programs educate students and visitors on the state of invasive species in Kāneʻohe Bay, the effects of erosion, nonpoint source pollution, removal of any plants or animals from Kāneʻohe Bay, and climate change on the ecosystem, and the nexus of human activities and traditional agriculture and the natural ecosystem. At the state level, the perspective of building capacity for community participation in resource management through education and outreach is also being achieved in Heʻeia through site partners' educational programs.

4.2.3 Heʻeia NERR Education, Training, and Interpretation Program Capacity

Educators at HIMB and on the main campus of UH Mānoa have established and ongoing projects that can be leveraged by the establishment of the Heʻeia NERR Education program. Examples of these educators and programs include:

Dr. Judy Lemus is a tenured faculty specialist at HIMB. With a strong interest and focus in community based participatory research, she develops educational and professional development opportunities for undergraduate and graduate students, teachers, and community members. She has worked closely with both Paepae o He'eia and Kako'o Oiwi on programs that engage community interns and educational docents in scientific research. She also creates outreach materials for these programs and has developed an iPhone app that provides virtual and on-site walking tours of He'eia Fishpond (with over 1100 downloads). She currently serves as the president of the Board of Directors for Paepae o He'eia, and is a member of the Kāneʻohe Bay Regional Council, a governor appointed group that provides input to state agencies on recreational, commercial and educational activities in Kāneʻohe Bay.

Dr. Malia Rivera is a tenured faculty specialist at HIMB that has led an emerging program in K-12 marine science education at HIMB, specifically aimed to better serve the Hawaii's students from local schools. Her projects and programs focus on providing pathways for Hawaii's underrepresented students to enter STEM careers, and includes marine science curriculum for K-12, intensive summer programs for high school students and early undergraduates, scientific inquiry focused teacher professional development workshops, research internships for high school and early undergraduate students at HIMB, and training

science focused graduate students in teaching and pedagogy in place and culturally based settings. She also led the effort to fundraise, design and build the HIMB Marine Science Research Learning Center at Moku o Loʻe, a facility dedicated to outreach and education programming at HIMB, as well as secured funding to acquire a 45 passenger vessel to support outreach and education for HIMB's education programs.

Mark Heckman is an education specialist faculty at HIMB where he oversees the Community Education Program. Mark's interests span a wide range of subject matters and age groups that focus on creating positive science experiences for all ages and pathways to science for those that have the greatest need. Mark is currently developing sustainable long term programs to provide culturally relevant science training opportunities and access for students, families and the public. His current collaborations and grants include programs with the Pacific American Foundation to provide pathways into science for Windward Oʻahu students, the Smithsonian Institution, the Robert Wood Johnson Foundation, NOAA and others. He is the past chair of OCEANIA, the local chapter of the National Marine Educators Association, vice chair of Hui o Koʻolaupoko, a Windward Oʻahu non-profit organization that works to improve water quality), and serves on the advisory committees for the Nalu Studies program (focusing on high risk and non-traditional students) and the Watershed Investigations, Research, Education and Design (WIRED) program for grades 6-12 students.

4.2.4 Heʻeia NERR Education, Training, and Interpretation Program Delivery Plan

The He'eia NERR will provide all learners with opportunities to experience and engage with the Heʻeia ahupuaʻa ecosystem. Delivery will include place-based STEM links with traditional ecological and cultural knowledge programs provided by Heʻeia NERR partners. These programs will be coordinated with each other to emphasize the connectedness of the different components of the ecosystem: land-based, estuarine, and coastal marine environments. The education plan will also include integration with the Kāneʻohe Bay Information System and other web-based or mobile platforms for delivering information and programming to broader audiences.

4.2.5 Heʻeia NERR Education Future Need and Opportunities

The education-related needs identified by the site partners include the following:

- Create opportunities to coordinate academic and community based educational programs that are currently organized independently by the site partners;
- Align Heʻeia NERR education programs with the Hawaiʻi Department of Education and Next Generation Science Standards;
- Link research program (including its basis on ecosystem based management) to the education program;

- Incorporate traditional Hawaiian knowledge and skills in teaching the students and the community about Hawaiian estuaries and the ahupua‘a land management system;
- Involve kūpuna in educational activities and site tours of the ahupua‘a of He‘eia so as to integrate the cultural component into educational activities;
- Utilize He‘eia NERR as a field site for high school, undergraduate and graduate research and experiential learning opportunities. Infuse STEM training throughout the various programs to help create pathways for local students to continue on to undergraduate and graduate STEM and natural resource management related degree programs; and
- Provide opportunities to improve STEM and Environmental literacy amongst all members of the community.

As discussed above, the site partners of He‘eia NERR already have several independently organized educational programs and facilities available for K-12 students as well as for the community at large. The community identifies an overarching need to integrate their numerous independent educational programs and avoid duplication of effort and resources. The future education program at He‘eia NERR is seen as an opportunity by the community that would meet these needs by creating a platform that will allow for collaboration among the site partners’ independent educational programs. This need identified by the community also presents an opportunity for the newly designated He‘eia NERR to build a comprehensive educational program within the next 5 years that spans the learning continuum and provides pathways for local students to explore resource management, science research and STEM careers. The He‘eia NERR educational program shall build upon the existing resources, expertise, and facilities available to develop education programs such as K-12 Estuary Education Program (KEEP), Teachers on the Estuary (TOTE) program, as well as research and stewardship experiences for community, high school and college students, and community engagement opportunities for science focused graduate students.

Over the next 5 years, the He‘eia NERR Education Coordinator will develop an education, training, and interpretation program in He‘eia that will integrate and build on various ongoing academic and community-based educational programs in He‘eia, to meet the following goal and objectives.

Goal 2

Develop a place-based education and training program for the He‘eia NERR that **inspires and educates the community about estuaries, coastal ecosystems, and traditional Hawaiian practices**, such as lo‘i and loko i‘a, that mālama (nurture) these systems sustainably.

Objective 4 Increase student, educator, and community understanding of estuaries in general and in particular Hawaiian estuaries, coastal habitats, and the ahupuaʻa land management system.	
Strategies to Meet Objective 4	**Outcomes**
Strategy 4(a): Heʻeia NERR educational programs build on existing efforts and cultural resources (e.g. the poster by Marilyn Kahalewai of a traditional ahupuaʻa) and incorporate a traditional cultural perspective.	At least 50% of students and teachers participating in Heʻeia NERR educational programs demonstrate improved understanding of traditional Hawaiian culture.
Strategy 4(b): Kūpuna make traditional Hawaiian cultural information available to the Heʻeia NERR and local communities.	Local communities and the NERRS network have improved access to educational and cultural resources based on the Heʻeia ahupuaʻa.
Strategy 4(c): Heʻeia NERR will include kūpuna in Heʻeia site tours as part of a cultural orientation to the Heʻeia NERR site.	At least 50% of Heʻeia NERR visitors experience a cultural orientation to the Heʻeia NERR.
Strategy 4(d): Kūpuna testimonials are included as part of a cultural orientation to the Heʻeia NERR site.	At least 50% of Heʻeia NERR visitors experience a cultural orientation to the Heʻeia NERR.
Strategy 4(e): Heʻeia NERR staff develop programs that incorporate information about the entire ahupuaʻa of Heʻeia.	At least 50% of students and others participating in Heʻeia NERR programs have an improved understanding of the He'eia ahupuaʻa
Strategy 4(f): Provide site-specific educational experiences that facilitate hands-on exploration of the upland, estuarine, and marine environments in the Heʻeia estuary with site partners.	Annually, at least 2 education and training events at the Heʻeia NERR include hands-on activities coordinated with site partners.
Strategy 4(g): Translate Heʻeia NERR estuarine science and monitoring data to develop data visualizations for use in educational and training programs.	Increased understanding of estuarine science, monitoring data and the Heʻeia estuary.
Strategy 4(h): Heʻeia NERR staff will develop and establish the system- wide K-12 Estuarine Education Program (KEEP) at the Heʻeia NERR.	Heʻeia NERR has a NOAA approved KEEP program in place.

Strategy 4(i): Recruit and maintain He‘eia NERR educational, stewardship and cultural resource staff.	Staff are supporting He‘eia NERR educational, training and interpretation programs.
Strategy 4(j): Establish and maintain He‘eia NERR website.	Increased understanding of estuarine science, monitoring data and the He‘eia estuary.

Objective 5 Provide a comprehensive framework to integrate and enhance coordination and effectiveness of place-based education and training programs that have been initiated independently by the He‘eia community.	
Strategies to Meet Objective 5	**Outcomes**
Strategy 5(a): Collaborate with the Hawai‘i Department of Education (DOE) to explore ways to integrate state K-12 educational standards into He‘eia NERR education program curricula.	A pilot He‘eia NERR education program addresses state educational standards and is aligned with the K-12 curriculum for one elementary and one secondary grade band.
Strategy 5(a)1: Develop cultural standards and operating protocols for He‘eia NERR education, training, and interpretation programs at the He‘eia estuary with the assistance of stakeholders such as the KHCC and other native Hawaiian cultural practitioners in the He‘eia community. **Strategy 5(a)2:** The Stewardship and Cultural Resources Coordinator shall implement a cultural workshop with partners to coordinate discussions on cultural standards and protocols.	Place-based education programs at the He‘eia NERR incorporate and follow cultural protocols.
Strategy 5(c): Develop initiatives that allow the He‘eia NERR and site partners to coordinate and integrate aspects of their educational activities.	At least 2 site partners have integrated an educational program or aspects of their educational programs at the He‘eia NERR.

4.3 Stewardship Program

4.3.1 Stewardship in the Context of the He‘eia NERR

One of the key elements in establishing a NERR in He‘eia was the interest of the community in protecting and restoring the He‘eia estuary. Continuing that community support and involvement will require dedicated outreach to the public and key stakeholders to attract and retain the people that can help the He‘eia NERR accomplish its goals. Outreach will also establish close working partnerships with other groups that may be doing similar work to avoid duplication and wasted efforts, and to find new opportunities to partner and increase effectiveness.

Stewardship, including protecting and restoring the natural and cultural resources of the ahupua‘a of He‘eia, was one of the driving factors in the movement to establish the He‘eia NERR. The site partners each have a slightly different focus for stewardship projects, but have a common and overlapping commitment to sustainable natural and cultural resource management and conservation. They had the foresight to recognize that working together in a coordinated and integrated fashion would help everyone achieve their goals. The partners also recognized that becoming a NERR could help by providing a local and national program structure, technical support, and funding for research, education, training, facilities construction, and stewardship programs to help achieve common goals.

Figure 4-5. Stewardship activities such as restoring the fishpond wall teach the public about natural and cultural resources

(Photo courtesy of Paepae o He‘eia)

To help the He‘eia NERR and the national system achieve their vision, mission, goals, and objectives, the site partners are committed to implementing key natural and cultural resource management projects in the He‘eia NERR. These include the removal of invasive algae; introduction of native grazing urchins to control the spread of invasive algae; demonstration of traditional agricultural methods that rehabilitate the land and provide ecosystem services; restoration of native species’ habitats; and demonstration of traditional fishpond aquacultural practices that support estuary function and provide ecosystem services. He‘eia NERR staff will support the stewardship programs by providing technical assistance, monitoring, establishing baseline conditions for research, and planning assistance.

There are ongoing stewardship projects aimed at increasing the knowledge and awareness of priority coastal management issues such as invasive species, loss of habitat, erosion and sedimentation, nonpoint source pollution, water quality issues, agricultural development, and climate change impacts in the He‘eia area. Stewardship programs with He‘eia site partners help to build capacity for community participation in resource management through education and outreach.

4.3.2 He‘eia NERR Stewardship Needs and Opportunities

The site partners identified the following needs relative to stewardship:

- Increase understanding among the general public and coastal decisions makers about how human activities affect the He‘eia estuary.
- Provide opportunities and training on how the ahupua‘a land management system can be applied to address climate change, habitat restoration, and water quality in He‘eia watershed.
- Support ongoing restoration programs to improve the quality of coastal habitats.

Over the next 5 years, the He‘eia NERR Stewardship Coordinator will develop a stewardship program in He‘eia that will integrate and build on various ongoing academic and community-based educational programs in He‘eia, to meet the following goal and objectives.

Goal 3

The He‘eia NERR will engage various communities to create opportunities for collaboration to practice and promote stewardship that sustains cultural, biological, and natural resources.

Objective 6	
Integrate traditional knowledge and contemporary science to effectively address climate change, habitat restoration, and water quality.	
Strategies to Meet Objective 6	**Outcomes**
Strategy 6(a): Utilize historical photos, testimonials, and other information to document the land use history of the ahupuaʻa of Heʻeia and incorporate into Heʻeia NERR education and interpretative programs.	Visitors to the Heʻeia NERR indicate increased awareness of the interconnectedness of activities in the mauka and makai areas, including the history of cultural activities in the area and the effect changing uses has had on the ecosystem.
Strategy 6(b): Consult with the Koʻolaupoko Moku Kūpuna Council to develop methods for kūpuna to inform cultural and scientific education programs at the Heʻeia NERR.	Place-based cultural and scientific education programs at the Heʻeia NERR incorporate input from kūpuna.
Strategy 6(c): Develop and establish the Coastal Training Program to support training opportunities for targeted coastal decision maker audiences.	The Heʻeia NERR has a fully developed and NOAA approved Coastal Training Program.
Strategy 6(d): Provide technical assistance to site partners in support of ongoing traditional agricultural (taro loʻi) and aquaculture (Heʻeia Fishpond) practices	Measured improvements of targeted ecosystem services provided by traditional land use practices
Strategy 6(e): Collect and analyze ecosystem service data for each management approach implemented at the Heʻeia NERR.	Ecosystem service data inform strategies for adaptive management at Heʻeia estuary and other estuaries.

Objective 7
Engage and educate the community on the practices and values of the ahupuaʻa land management system; in other words, promote ʻāina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.

Strategies to Meet Objective 7	Outcomes
Strategy 7(a): Provide a variety of hands-on stewardship experiences to the community groups and visitors.	The community groups and visitors of the He‘eia NERR improve their understanding of ‘āina momona.
Strategy 7(b): Collaborate with partners to incorporate He‘eia NERR science, traditional knowledge and information in the rehabilitation of historical, agricultural and aquacultural resources within the He‘eia NERR.	The He‘eia NERR agricultural and aquacultural resources are managed sustainably to provide food security and other ecosystem services for local communities.

Objective 8 Become a leading repository of information for cultural, biological, and natural resources in the He‘eia estuary.	
Strategies to Meet Objective 8	**Outcomes**
Strategy 8(a): Organize and incorporate cultural and natural resource information from the broader community into the He‘eia NERR website and other accessible platforms.	Increased awareness of Heeia estuary resources and information.

Objective 9 Develop the tools, capacity and connections to increase public awareness across the community, island, state, nation, and the world of the ecological and cultural significance of the He‘eia estuary and ultimately the entire ahupua‘a of He‘eia.	
Strategies to Meet Objective 9	**Outcomes**
Strategy 9(a): Engage with site partners and other organizations such as local civic clubs to implement public outreach activities in the He‘eia ahupua‘a.	Communities and individuals gain an understanding of the ecological and cultural significance of the He‘eia estuary.
Strategy 9(b): He‘eia NERR staff utilize the expertise of cultural experts, such as the KHCC	Expertise of haku (ambassadors) are integrated into He‘eia NERR outreach activities.

members, as haku (ambassadors) for the He‘eia NERR.	
Strategy 9(c): Implement an assessment of He‘eia NERR facility needs.	He‘eia NERR has a plan that allows sufficient infrastructure and facilities to support research, education and stewardship programmatic activities.
Strategy 9(d): Recruit and hire a reserve manager to coordinate and supervise He‘eia NERR operations and management.	The He‘eia NERR management plan is implemented and core partnerships are established.
Strategy 9(e): The reserve manager will form and engage a Reserve Advisory Board (RAB) to gather advisory guidance on He‘eia NERR activities and planning.	Within the first year, the RAB is established and sets its meeting and committee structures.
Strategy 9(f): Establish and maintain He‘eia NERR website.	Increased understanding of ecological and cultural significance of the He‘eia estuary.
Strategy 9(g): Engage in the NERR national system and at relevant state, regional, national, and international scales.	Communities and individuals gain an understanding of the ecological and cultural significance of the He‘eia estuary.
Strategy 9(h): Plan for future He‘eia NERR facilities that integrate climate adaptation strategies and incorporate traditional Hawaiian values and customs.	He‘eia NERR facilities are resilient to a changing climate and embody the unique relationship between the Hawaiian people and the land.

Objective 10	
Support restoration of key areas in the He‘eia NERR to improve habitat and increase ecosystem services.	
Strategies to Meet Objective 10	**Outcomes**
Strategy 10(a): Demonstrate restoration best practices in the land and estuarine stewardship of He‘eia NERR natural resources that support climate change adaptation.	He‘eia NERR natural resource are more resilient to a changing climate.

Strategy 10(b): Revise land acquisition and habitat restoration projects, taking into account climate change impacts.	By 2018, land acquisition and habitat restoration plans are revised to incorporate climate vulnerabilities.
Strategy 10(c): He‘eia NERR uses a multi-disciplinary and multi- sector approach in the implementation of restoration initiatives.	He‘eia NERR is viewed as an example of multi-disciplinary and traditional approaches to ecosystem-based management.
Strategy 10(d): Work with partners to develop and implement a hybrid ecosystem framework for upland reforestation.	Measured improvements of targeted ecosystem services provided by upland habitat.
Strategy 10(e): Provide technical and monitoring assistance to support the removal of mangrove habitat and replacement with native estuarine species.	Measured improvements of targeted ecosystem services provided by estuarine habitat.
Strategy 10(f): Develop a restoration and monitoring plan in collaboration with partners to guide the restoration of the He‘eia Stream and adjacent buffer.	Restoration and monitoring plan guides future stream restoration and monitoring.
Strategy 10(g): Provide technical assistance and support for the removal of invasive species and the establishment native plant communities within the Heeia stream buffer and stream channels.	Measured improvements of targeted ecosystem services provided by the He‘eia stream and riparian habitats.
Strategy 10(h): Collaborate with partners on existing coral reef restoration and monitoring initiatives that are occuring within the marine boundaries of the He‘eia NERR.	Measured improvements of targeted ecosystem services provided by marine habitat.
Strategy 10(i): Coordinate future restoration planning and monitoring activities within marine boundaries of the He‘eia NERR.	Partners actively coordinate their marine restoration with He‘eia NERR staff.

Section 5. Administrative Plan

The administration plan describes the context of the state and federal agencies under which the NERRS is managed, as well as the state agency administrative and management structure for the He‘eia NERR (Figure 5-1). The administrative plan also describes the roles and responsibilities of the He‘eia NERR’s core staff and additional staff, reserve advisory board (RAB), identifies strategic partners, and community support groups. During the initial five years, it is anticipated that some expertise needs of the He‘eia NERR will be met with part-time hires, interns and strategic partners, as well as project volunteers. The administration-related objectives and strategies identified in the He‘eia NERR Strategic Plan are as follows.

He’eia NERR Administrative Objectives and Strategies

Administrative Objectives	Strategies
Objective 1: Baseline environmental data informs researchers' understanding of the magnitude of changes in the various He‘eia ecosystems.	**Strategy 1(k):** Recruit and maintain He‘eia NERR research and monitoring staff.
Objective 2: Coordinate independent research and monitoring efforts in the ahupua‘a.	**Strategy 2(d):** Recruit and maintain He‘eia NERR research and monitoring staff.
	Strategy 2(e): Collaborate with new partners conducting relevant research and monitoring efforts
Objective 3: Integrate traditional knowledge and research in the He‘eia NERR that will better reflect and inform community decision making toward creating a sustainable ecosystem.	**Strategy 3(c):** Work with site partners to share ecosystem-based best management practices that support improved management of the He‘eia ahupua‘a.
	Strategy 3(e): Recruit and maintain He‘eia NERR educational and cultural staff.
Objective 4: Increase student, educator, and community understanding of estuaries in general and in particular Hawaiian estuaries, coastal habitats, and the ahupua‘a land management system.	**Strategy 4(i):** Recruit and maintain He‘eia NERR educational, stewardship and cultural resource staff.
	Strategy 4(j): Establish and maintain He‘eia NERR website.

Objective 5: Provide a comprehensive framework to integrate and enhance coordination and effectiveness of place-based education and training programs that have been initiated independently by the He‘eia community.	**Strategy 5(c):** Develop initiatives that allow the He‘eia NERR and site partners to coordinate and integrate aspects of their educational activities.
Objective 6: Integrate traditional knowledge and contemporary science to effectively address climate change, habitat restoration, and water quality.	**Strategy 6(d):** Provide technical assistance to site partners in support of ongoing traditional agricultural (taro lo‘i) and aquaculture (He‘eia Fishpond) practices.
Objective 8: Become a leading repository of information for cultural, biological, and natural resources in the He‘eia estuary.	**Strategy 8(a):** Organize and incorporate cultural and natural resource information from the broader community into the He‘eia NERR website and other accessible platforms.
Objective 9: Develop the tools, capacity and connections to increase public awareness across the community, island, state, nation, and the world of the ecological and cultural significance of the He‘eia estuary and ultimately the entire ahupua‘a of He‘eia.	**Strategy 9(d):** Recruit and hire a Reserve Manager to coordinate and supervise He‘eia NERR operations and management.
	Strategy 9(e): The Reserve Manager will form and engage a Reserve Advisory Board (RAB) to gather advisory guidance on He‘eia NERR activities and planning.
	Strategy 9(f): Establish and maintain He‘eia NERR website.
	Strategy 9(g): Engage in the NERR national system and at relevant state, regional, national, and international scales.
Objective 10: Support restoration of key areas in the He‘eia NERR to improve habitat and increase ecosystem services.	**Strategy 10(e):** Provide technical and monitoring assistance to support the removal of mangrove habitat and replacement with native estuarine species.
	Strategy 10(g): Provide technical assistance and support for the removal of invasive species and the establishment native plant communities within the He‘eia Stream buffer and stream channels.

5.1 The He‘eia NERR Operational Guiding Principles

- The He‘eia NERR will strengthen its relationship with NOAA;
- The He‘eia NERR will strengthen its relationship with OP-CZM;

- The He‘eia NERR will ensure its operating infrastructure is adequate to fulfill its mission;
- The He‘eia NERR will ensure that it has sufficient staff to meet its goals and objectives;
- The He‘eia NERR will ensure that its staff has the skills necessary to perform their duties and responsibilities;
- The He‘eia NERR staff will have a thorough understanding of the ahupua‘a principles and an understanding of the ahupua‘a of He’eia;
- The community and other government agencies will recognize the He‘eia NERR as a source of relevant and current information on the He‘eia estuary and ahupua‘a;
- The He‘eia NERR staff will be fully engaged to seek funding opportunities to meet its goals and objectives.

5.2 Organizational Framework and Management Authorities

The NERRs in the national system operate as federal/state partnerships. The State of Hawai‘i, through UH’s HIMB, will manage the operation of the He‘eia NERR, while the federal government, represented by NOAA, will provide funding, national guidance, and technical assistance. The roles and responsibilities of the University and NOAA in operating the He‘eia NERR are laid out in a Memorandum of Understanding (Appendix J). The various landowners in the He‘eia NERR also have a major role to play in implementing the goals, objectives and strategies developed in this management plan. How the various partners interact with HIMB as the lead state partner for the He‘eia NERR, and with each other, is laid out in an additional Multi-Party Governance Charter between the land owners within the He‘eia NERR (Appendix K). The agreement is entered between UH and the various land owners whose property has been voluntarily included in the He‘eia NERR and where research, education, training and stewardship activities will take place.

The state role in the NERR program includes providing 30% matching funds for NERR program grants, demonstrating adequate control over nonfederal lands included in the He‘eia NERR (either through ownership or cooperative agreement with private landowners), providing adequate staffing for the He‘eia NERR, and overseeing program implementation. Because the He‘eia NERR contains a mix of private and state lands, responsibility for land management actions, including manipulation and restoration activities, will remain with the governmental agency and/or private landowner that has statutory or legal authority.

The federal role in the NERR program includes providing NERR program grants, subject to appropriations, coordinating between the national system and local programs, and supplying technical assistance for NERR program implementation. Also, pursuant to CZMA (Sections 312 and 315), NOAA periodically conducts performance evaluations of the operation and management of reserves.

HIMB will manage the day-to-day operations of the He‘eia NERR. The He‘eia NERR will be considered an operational unit under HIMB, and He‘eia NERR staff will report to and will be accountable to HIMB leadership. HIMB is administratively located within the School of Ocean and Earth Science and Technology (SOEST) at UH. SOEST and UH will provide administrative, financial, and human resources (personnel) support under applicable state and UH policies and procedures. HIMB will provide overall program direction and guidance and assist with day-to-day administration and coordination within SOEST’s and UH’s organizational structure. HIMB and UH administrative staff will provide assistance with financial and personnel management, purchasing, logistics, and community interaction. Initially, five dedicated positions are suggested to provide overall management of the He‘eia NERR and implement He‘eia NERR programs for research, education, and stewardship, as described in the next section.

Currently, each NERR receives an average federal funding allocation of $550,000 (made available to NERR sites under CZMA Section 315). Establishing state-funded positions in UH’s HIMB budget will provide the 30% match requirement for the federal grant. Additional support may include salaries from state funded personnel performing work or research within the He‘eia NERR, an in-kind match of volunteer labor, or materials provided by community organizations or site partners, additional funding for the He‘eia NERR from the state legislature (via various partner agency budgets), and state or private grant awards.

5.3 He‘eia NERR Staff and Future Needs

The State of Hawai‘i will provide staff position lines to HIMB for the He‘eia NERR to meet its goals and objectives as outlined in this management plan. Core staff as required by NOAA will consist of a Reserve Manager, Research Coordinator, and Education Coordinator. Two additional roles necessary for the He‘eia NERR include a Stewardship Coordinator who will coordinate with the partners in the He‘eia NERR, and a Cultural Resource Coordinator who will ensure activities taking place within the He‘eia NERR are conducted in a culturally appropriate manner as well as give a cultural, place-based perspective to He‘eia NERR programs. The He‘eia NERR staff will report to HIMB leadership and will be hired by HIMB following UH personnel hiring policies and procedures.

To meet the initial staffing and program needs, at least five staff positions will be sought (Reserve Manager, Research Coordinator, Education Coordinator, Stewardship Coordinator, Cultural Resource Coordinator) to augment the current UH budget, the salaries of which will be covered by state general funds, during the appropriate State legislative session. If approved, these positions will be available once the He‘eia NERR has been designated. Cost-sharing with partner organizations is another staffing option. Additional positions, as outlined in section 5.3.6 below, may be created as the program grows and resources become available. The roles and responsibilities of the staff positions are described below.

5.3.1 Reserve Manager

The Reserve Manager will coordinate and supervise all aspects of He‘eia NERR operations and management, including administrative, funding, research, stewardship, training, and educational activities. The Reserve Manager will serve as a liaison between federal, state, and local government agencies, the community, and private entities, including advisory committees or boards, to achieve the goals and objectives of the He‘eia NERR. The Reserve Manager will also be the principal point of contact for outside agencies. The Reserve Manager will be an HIMB employee and will report to HIMB leadership.

5.3.2 Research Coordinator

The Research Coordinator will oversee the operation and implementation of the He‘eia NERR research and monitoring program, coordinate site partner research programs, interpret research results, promote the use of the He‘eia NERR by other researchers, and interact with other research institutions and individuals to fulfill the research goals and objectives of the He‘eia NERR. The Research Coordinator will work to collaborate with site partners and other coordinators of the He‘eia NERR to develop and present scientific information in a user-friendly manner. The Research Coordinator will develop and initially implement the System Wide Monitoring Program (SWMP) which will help to support and inform research as it is conducted in the He‘eia NERR. The Research Coordinator will be an HIMB employee and will report to the Reserve Manager.

5.3.3 Education Coordinator

The Education Coordinator will oversee the daily operation and implementation of the He‘eia NERR education programs, including on-site and outreach activities. The Education Coordinator will interact with other environmental education organizations and individuals, other sectors of the He‘eia NERR, and other coordinators of the He‘eia NERR to fulfill educational goals and objectives and to present science and stewardship information in a user-friendly manner to schools and the public. These activities will include formal and informal education for the public, teachers, and students. The Education Coordinator will develop and implement the Coastal Training Program for local decision-makers and resource professionals. The Education Coordinator will be an HIMB employee and will report to the Reserve Manager.

5.3.4 Stewardship Coordinator

The Stewardship Coordinator will oversee the resource management activities in the He‘eia NERR, including restoration and manipulation activities. The Stewardship Coordinator will cooperate with land managers and other coordinators of the He‘eia NERR to enhance public awareness and understanding of the estuary and the resource management activities taking place in the He‘eia NERR. The Stewardship Coordinator will be an HIMB employee and will report to the Reserve Manager.

5.3.5 Cultural Resource Coordinator

The Cultural Resource Coordinator will be critical in convening the cultural partners and ensuring that the goals and objectives in this management plan related to the cultural components are implemented in a culturally responsible and sensitive manner. The Cultural Resources Coordinator will cooperate with other coordinators of the He‘eia NERR to support the education, research, and stewardship programs by giving a place-based, cultural perspective to these activities. The Cultural Resource Coordinator will focus on cultural aspects of coastal issues including endemic, native and naturalized species management, integrating traditional knowledge with scientific research on resource management techniques, and the interconnectedness of the ecosystems within the ahupua‘a. The Cultural Resource Coordinator will be an HIMB employee and will report to the Reserve Manager.

5.3.6 Additional Staff

Once the He‘eia NERR is established and program activities are established, additional staffing or expertise may enhance the effectiveness of the activities outlined in this management plan. It is anticipated that the positions will be provided by a combination of full-time or part-time hires, interns and strategic partnerships, as well as volunteers. Based on the management plan’s goals and objectives, the following positions will likely be needed:

- Administrative Assistant: Support the He‘eia NERR manager including clerical, grant management, and operational support to He‘eia NERR activities.
- Coastal Training Coordinator: Oversee the continued implementation of the Coastal Training Program for local decision-makers and resource professionals to support the goals and objectives of the He‘eia NERR, especially supporting the monitoring of ecosystem services provided by management strategies in the He‘eia NERR.
- Technical Assistant for the System Wide Monitoring Program (SWMP): Maintain SWMP equipment, collect samples for water quality and nutrient monitoring, troubleshoot problems and compile and submit data to the NERRS Centralized Data Management Office, as well as assist with He‘eia NERR research and education programs, especially supporting the monitoring of ecosystem services provided by management strategies in the He‘eia NERR.
- Geographic Information Systems (GIS) Technician: Utilize GIS technology to support He‘eia NERR activities, including map-making, land cover and land use analysis, ground-truthing for research projects, field work, and resource management.
- Research Analyst: Analyze data and assist with research projects and monitoring of ecosystem services provided by management strategies in the He‘eia NERR, in support of the primary research question of the He‘eia NERR.

- Watershed Specialist: Coordinate with additional watershed partnerships and organizations within the He‘eia and surrounding watersheds, ensuring He‘eia NERR activities are informed by nearby developments in the watershed.

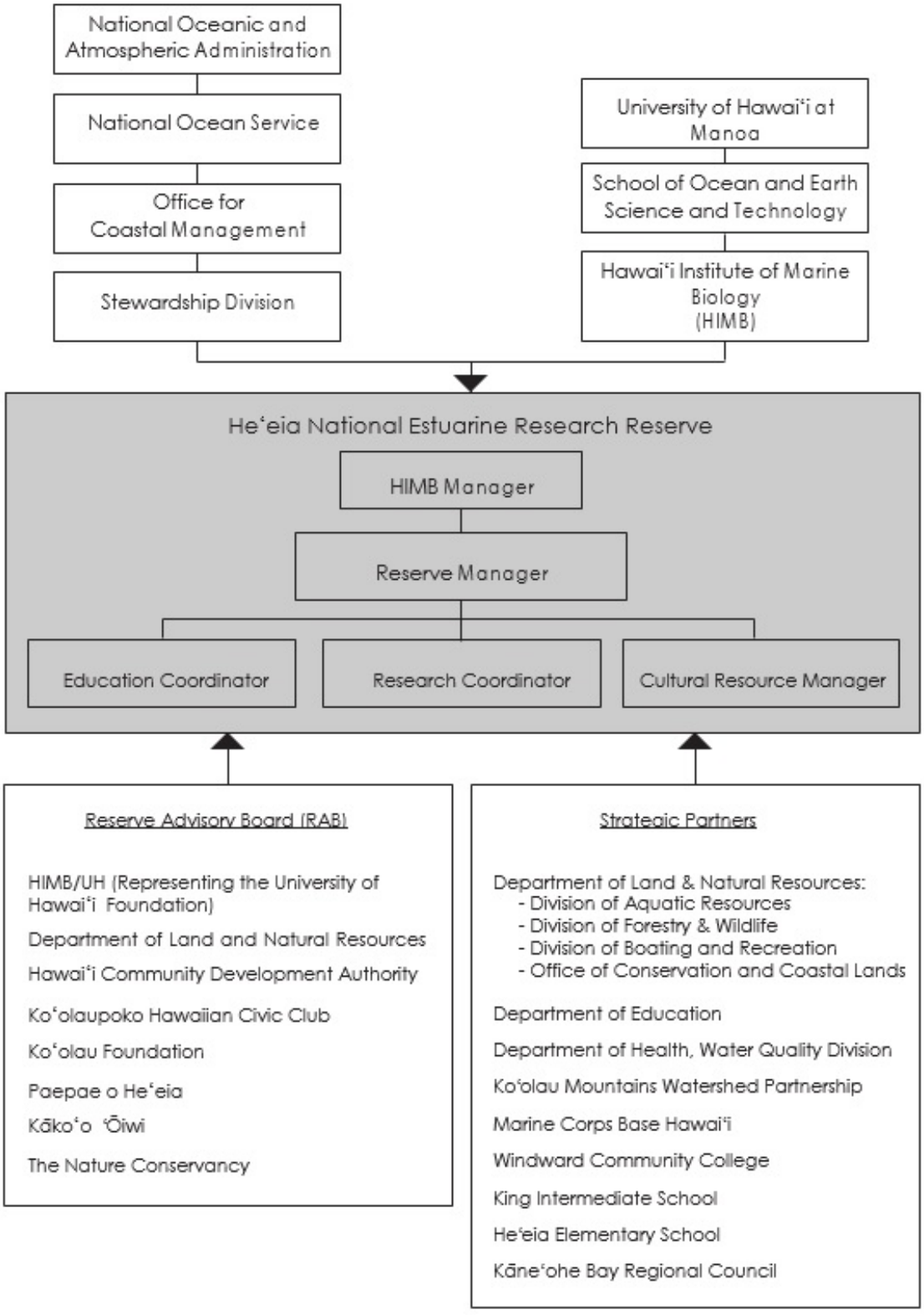

Figure 5.1. He'eia NERR administrative organization chart

5.4 Strategic Partnerships

The successful implementation of a NERR management plan occurs through a collaborative process involving a variety of agencies, organizations, and community partners at various levels of participation and contribution. Strategic partnerships are needed to leverage specific resources and talent to carry out core functions of the He‘eia NERR and assist with stewardship, educational programs, research, and operations. The following list identifies some of the key partnerships that will support the mission of the He‘eia NERR along with HIMB and He‘eia NERR staff. These partners could provide in-kind staffing, expertise and resources, financial resources, facilities, etc. These partners include:

- Ko‘olaupoko Hawaiian Civic Club
- Ko‘olau Foundation
- Kāko‘o ‘Ōiwi
- Paepae o He‘eia
- Department of Land and Natural Resources
  - Division of Aquatic Resources
  - Division of Forestry and Wildlife
  - Division of Boating and Ocean Recreation
  - Office of Conservation and Coastal Lands
  - State Historic Preservation Division
- Hawai‘i Community Development Authority
- Kamehameha Schools
- The Nature Conservancy
- Kama‘āina Kids
- Department of Education
- Department of Health, Clean Water Branch
- Kāne‘ohe Bay Regional Council
- Ko‘olau Mountains Watershed Partnership
- Marine Corps Base Hawai‘i
- Windward Community College
- King Intermediate School

- He‘eia Elementary School

The roles and functions of these partners in relation to the He‘eia NERR will be developed and expanded as the specific needs for support emerge and change during the implementation of the He‘eia NERR management plan. New partnerships can be created as opportunities arise.

5.5 Advisory Committees

5.5.1 Reserve Advisory Board

The policies, activities, and programs of the He‘eia NERR will be developed and implemented with input from the Reserve Advisory Board (RAB). Land for the He‘eia NERR is owned in part by the UH Foundation (Moku o Lo‘e), Kamehameha Schools (He‘eia Fishpond), HCDA (He‘eia CDD), and DLNR (He‘eia State Park and Kāne‘ohe Bay waters). The RAB will be created upon designation of the He‘eia NERR by NOAA and its members will adopt the Multi-Party Governance Charter (Appendix K).

Members of the RAB include:

- Hawai‘i Institute of Marine Biology (Representing the UH Foundation)
- Department of Land and Natural Resources
- Hawai‘i Community Development Authority
- Paepae o He‘eia
- Ko‘olaupoko Hawaiian Civic Club
- Ko‘olau Foundation
- Kāko‘o ‘Ōiwi
- The Nature Conservancy

The RAB will advise HIMB and He‘eia NERR staff on management, research and monitoring activities, educational programs, and stewardship activities based on the approved management plan. The RAB will also help enable the development and maintenance of partnerships and cooperative efforts with the community; local, state, and federal agencies; and other research and educational institutions. The RAB, once formed, will set its meeting structure and membership provisions, create committees or subcommittees as necessary to gather technical information or community input, and establish specific roles and responsibilities to best support the implementation of the management plan. See the Multi-Party Governance Charter (Appendix K) for more details on the role of the RAB.

5.5.2 Other Committees

The He‘eia NERR Reserve Manager, in coordination with the RAB, will be able to create committees or subcommittees as necessary to gather technical information or community input to implement the

management plan. Advisory committees may be particularly useful in the early stages of developing He‘eia NERR programs; they can be used to solicit input on community priorities, garner support and resources, and recruit additional He‘eia NERR program staff to implement programs. Some potential program advisory committees are described below.

Kūpuna Advisory Committee

The He‘eia NERR Reserve Manager and RAB may establish a Kūpuna Advisory Committee to provide cultural guidance to the Board on cultural protocols, Native Hawaiian traditional and customary practices either within the He‘eia NERR or within the ahupua‘a of He‘eia, or any other relevant and appropriate cultural information. The Kūpuna Advisory Committee shall be composed of Kūpuna or cultural practitioners familiar with the ahupua‘a of He‘eia or its cultural resources.

Research Advisory Committee

The He‘eia NERR Reserve Manager and RAB may establish a research advisory committee to coordinate and provide input on the He‘eia NERR’s research and monitoring program. This group will be chaired by the He‘eia NERR Research Coordinator and be composed of research staff from the RAB, federal and state agency staff, and visiting researchers who have an interest in the He‘eia NERR research program.

Education Advisory Committee

The He‘eia NERR Reserve Manager and RAB may establish an education advisory committee to coordinate and provide input on the He‘eia NERR’s education programs. This group will be chaired by the He‘eia NERR Education Coordinator and be composed of education staff from the RAB; federal and state agency staff; teachers and administrators representing a variety of levels, geographic areas, and subjects; and visiting educators who have an interest in the He‘eia NERR education program. The group can provide community input and planning support for developing and implementing NERRS education programs such as TOTE and KEEP. Cultural educators may also sit on the education advisory committee to ensure cultural aspects are considered in developing education programs at the He‘eia NERR.

Cultural Resource Committee

The He‘eia NERR Reserve Manager and RAB may establish a cultural resource committee to coordinate and provide input on cultural aspects of He‘eia NERR programs. The group will be co-chaired by the He‘eia NERR Cultural Resource Coordinator and He‘eia NERR Stewardship Coordinator, and be composed of members from the RAB, cultural practitioners, and those whose families have lineal and cultural connections to the ahupua‘a of He‘eia, as well as cultural educators.

Section 6. Resource Protection Plan

This plan will support the resource protection-related objectives and strategies listed below and identified in the He‘eia NERR Strategic Plan.

He‘eia NERR Resource Protection-Related Objectives and Strategies

Objective 1: Baseline environmental data informs researchers’ understanding of the magnitude of changes in the various He‘eia ecosystems.	**Strategy 1(g):** Conduct scientific research and monitoring that will provide information on climate change, water quality, estuary habitat change, and other topics of local and national interest and significance.
Objective 7: Engage and educate the community on the practices and values of the ahupua‘a land management system; in other words, promote ‘āina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.	**Strategy 7(b):** Collaborate with partners to incorporate He‘eia NERR science, traditional knowledge and information in the rehabilitation of historical, agricultural and aquacultural resources within the He‘eia NERR.
Objective 10: Support restoration of key areas in the He‘eia NERR to improve habitat and increase ecosystem services.	**Strategy 10(c):** He‘eia NERR uses a multi-disciplinary and multi- sector approach in the implementation of restoration initiatives.

The resource protection plan is a required element of a reserve management plan, per 15 CFR 921.13. The general provisions provided by 15 CFR 921.1 state that reserves shall be open to the public to the extent allowed by state and federal law, and multiple uses are allowed to the degree that they are compatible with reserve purpose and use levels prescribed in the management plan. Additionally, regulations note that the management plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. Protecting the resources of the reserve serves as the foundation for all programmatic efforts and is central to the success of the reserve. It is important for reserves to protect the ecological unit representative of key lands and waters in each biogeographic region and to maintain it in the face of human and natural stressors that are continually increasing.

This management plan's resource protection plan provides a description of the authorities that protect the He'eia NERR, allowable and unallowable uses per those authorities, uses requiring a permit, and the initial monitoring, surveillance, and enforcement strategies that will be employed to protect resources in the He'eia NERR. The authorities detailed in the management plan are the existing authorities that are in place to protect the He'eia NERR. Designating the He'eia NERR does not add new regulations or restrictions on uses or activities within the He'eia NERR. The currently existing regulations are enforced within the capabilities of the federal, state, and county enforcement authorities as assisted by a supportive community. Supporting those efforts, and building close working relationships with enforcement entities and the community to help protect the resources will be essential to meet the protection goals and objectives of the He'eia NERR.

6.1 Resource Protection Challenges

Maintaining adequate control of reserve resources can be challenging. External stressors that may affect or degrade resources in the He'eia NERR include discharges of contaminants from the surrounding urban area, erosion, degradation of the watershed and streams caused by invasive plants and animals, loss of biodiversity, introduction of new harmful invasive species or diseases, unsustainable commercial and public recreational uses, overfishing, and changing climatic conditions.

Based upon community input and preliminary research, the major resource protection challenges facing the He'eia NERR in the next 5 years are:

- degradation of water quality and coral reefs from land-based erosion and pollutants,
- introduction and spread of invasive species and diseases,
- climate change, and the loss of ecosystem resilience,
- damage to coral reefs and fish stocks from consumptive and nonconsumptive commercial and recreational uses, and
- vandalism, theft, or destruction of natural and cultural resources, facilities, and agricultural products.

6.2 Reserve Protection Strategy

The He'eia NERR consists of a mix of public and private properties with established authorities specific to each of the landowners. These authorities, when applied together, serve to protect the natural and cultural resources of the area and promote a stable environment for research, monitoring, education, training, and stewardship programs that address local coastal management issues. The reserve protection strategy is divided into two elements: monitoring of the existing condition of the resources, which allows authorities

to identify and prevent harmful impacts on the integrity of the ecosystem, and surveillance and enforcement of unauthorized or harmful activities that may affect the integrity of the He‘eia NERR.

The monitoring element of the reserve protection strategy is embodied by the He‘eia NERR’s research and monitoring program (see Section 4.1). The goal and objectives of the research and monitoring program include strategies to develop a comprehensive, long-term, baseline environmental monitoring program to understand the effects of human manipulation and restoration activities, climate change and natural events on the ecosystem services provided by the area. This program will provide information to track trends in resource health and conditions and detect any deleterious effects such as increased erosion, import of pesticides or other toxicants harmful to species and habitats, introduction of diseases or invasive species harmful to native ecosystems, die-offs of native species such as large mortality events from coral bleaching or coral diseases, and declines in ecosystem services or degradation of species, habitats, or cultural resources essential to the systems of the He‘eia NERR. If deleterious effects are detected, prevention, minimization, and mitigation measures can be implemented to protect or prevent impacts on resources and, if associated with land management activities, practices can be adapted to avoid impacts in the future.

6.3 Surveillance and Enforcement

The He‘eia NERR has no law enforcement jurisdiction and relies on the enforcement authorities of DLNR, USFWS, NOAA, and City and County of Honolulu police to enforce regulations pertaining to public safety, building, traffic, littering, dumping, hunting, fishing, boating, commercial use of public lands, research, and take of protected species. Many of these activities may require county, state, or federal permits or approvals. Use of all lands in the He‘eia NERR will require the permission of the landowners or their agents and be subject to conditions imposed by the land owner or their agents. No He‘eia NERR restrictions or use restraints will be imposed on outside researchers conducting studies on public lands or in public waters. Research permits may be required by DLNR, USFWS, and/or NOAA for destructive sampling and collecting of plants or vertebrates on public or private lands. The He‘eia NERR does not create any new permitting requirements; existing permitting requirements would still apply within the He‘eia NERR. Violations of permits and conditions will be subject to the sanctions and penalties provided by City and County of Honolulu, DLNR, USFWS, and NOAA, as the issuing authorities.

The Reserve Manager will be the day-to-day liaison with the county, state, and federal law enforcement authorities. All He‘eia NERR staff, site partners, and employees will be aware of the rules and regulations regarding allowable uses within the He‘eia NERR, and will be on the lookout for any violations or enforcement problems in the area. If observed, violations will be reported to the Reserve Manager and proper authorities. The Research Coordinator will be responsible for tracking research activities and will be aware of any research permit requirements to provide guidance and assistance to researchers.

The community members and strategic partners that are often present in the He‘eia NERR, participating in education and research programs or enjoying recreational opportunities, have a role to play in protecting the He‘eia NERR as well. They are often the eyes and ears that see and hear activities that are not allowed or could damage resources and that should be stopped or investigated. The community is therefore encouraged to look out for potential problems, and to contact the Reserve Manager and law enforcement authorities to report suspected rule violations or harmful actions. DLNR has organized community enforcement support groups such as the Makai Watch in communities across the state; the RAB and Reserve Manager will evaluate the need for establishing a Makai Watch or similar group for the He‘eia NERR, and if such a group is deemed necessary for the area, will provide the necessary administrative and logistical support for establishing it.

Management authorities, rules, and regulations; allowable and unallowable uses; and law enforcement entities and partnerships that protect the He‘eia NERR are discussed in the following subsections.

6.4 Management Authorities and Law Enforcement Partners

6.4.1 Federal Regulatory Agencies, Management Authorities, and Enforcement Entities

NOAA’s Office of Law Enforcement

NOAA’s Office of Law Enforcement protects marine wildlife and habitat by enforcing domestic laws and international treaty requirements designed to ensure that these global resources are available for future generations. The Office’s special agents and enforcement officers ensure compliance with the nation’s marine resource laws and take enforcement action when these laws are violated. NOAA has law enforcement personnel stationed on O‘ahu, who are available to investigate and respond to federal ocean resource enforcement violations (NOAA Office of Law Enforcement 2015).

NOAA National Marine Fisheries Service (NMFS)

NMFS has regulatory responsibility for identifying essential fish habitats for federally regulated species of fishes, and carrying out provisions of the Magnuson-Stevens Act, the Endangered Species Act, and the Marine Mammal Protection Act. NMFS also provides input to the U.S. Army Corps of Engineers (USACE) on wetland permits issued under the CWA. NMFS’s Protected Resources Division (PRD) is dedicated to protecting and recovering endangered and threatened species of sea turtles, monk seals, and cetaceans and strives to ensure the recovery and survival of the protected marine species. NMFS and the PRD have personnel stationed on O‘ahu who respond to reports of live and dead stranded or distressed marine mammals in the main Hawaiian Islands. These personnel can assist with responses to diseases and other threats to protected marine species in the He‘eia NERR (NMFS PIRO 2015).

U.S. Fish and Wildlife Service (USFWS)

USFWS has regulatory authority over effects on endangered species and migratory birds as they relate to the He‘eia NERR, and is a potential partner in funding restoration activities. USFWS also makes recommendations to USACE regarding wetland permits. USFWS has enforcement personnel stationed on O‘ahu, who are available to investigate and respond to federal violations. USFWS refuge and ecological services staff also are stationed on O‘ahu; these staff members can assist with responses to diseases and other threats to protected species, such as by investigating disease outbreaks and helping with containment and recovery (USFWS PIFWO 2015).

U.S. Environmental Protection Agency (EPA)

EPA works with its federal, state and tribal regulatory partners to monitor and ensure compliance with clean water laws and regulations in order to protect human health and the environment. Section 404 of the CWA regulates the placement of dredged or fill material into wetlands, streams, estuaries and other waters. The goal of Section 404 is to avoid and minimize losses to wetlands and other waters and to compensate for unavoidable loss through mitigation and restoration. Section 404 is jointly implemented by EPA and the USACE. The USACE issues Section 404 permits and monitors compliance with the issued permits. Both the USACE and EPA are responsible for on-site investigations and enforcement of unpermitted discharges under CWA Section 404 (EPA 2015). EPA also shares permitting and enforcement authority for federal wetlands with the HIDOH, CWB, who administer the Section 401 Water Quality Certification Program in Hawai‘i (HIDOH CWB 2015). A Section 401 water quality certification is required for EPA and USACE to issue a wetland fill permit (EPA 2015).

U.S. Army Corps of Engineers (USACE)

USACE is responsible for administration of the federal wetland permitting program for the tidal and nontidal wetlands in the He‘eia NERR and adjacent waters and wetlands. The USACE’s Regulatory Program is committed to protecting the Nation’s aquatic resources, while allowing reasonable development through fair, flexible and balanced permit decisions. The Corps evaluates permit applications for essentially all construction activities that occur in the Nation’s waters, including wetlands. The local USACE regulatory office is the Honolulu District office located at Fort Shafter on O‘ahu (USACE 2015).

6.4.2 State Regulatory Agencies, Management Authorities, and Enforcement Entities

DLNR Division of Conservation and Resources Enforcement (DOCARE)

DOCARE is responsible for the enforcement activities of the DLNR. The division, with full police powers, enforces all state laws and rules involving state lands, state parks, historic sites, forest reserves, aquatic life and wildlife areas, coastal zones, conservation districts, and state shores, as well as county ordinances involving county parks. The division also enforces laws relating to firearms, ammunition, and dangerous weapons (DLNR 2015).

One of DOCARE's community-based assistance programs is the DLNR Makai Watch Volunteer Program. The Makai Watch is an officially recognized DLNR program to create more effective management of Hawai'i's near-shore marine resources (DOCARE 2015). The program is a voluntary, community-based partnership that involves volunteers and nongovernmental organizations such as The Nature Conservancy (TNC), Kua'āina Ulu 'Auamo, (KUA), the Hawai'i Wildlife Fund (HWF), Project S.E.A.-Link, Conservation International (CI) Hawai'i and the Harold K. Castle Foundation. Makai Watch volunteers assist DLNR by acting as the 'eyes and ears' of conservation enforcement in the community. The program trains volunteers on observation and incident reporting, ocean awareness and outreach, common regulated species found in Makai Watch areas, and traditional and modern ocean management tools. Trainees also learn to practice cultural awareness when engaging with resource users, providing for more positive interactions with local families and fishers.

DLNR Division of State Parks

The DLNR Division of State Parks manages and administers 52 state parks encompassing nearly 25,000 acres on the state's five major islands. These parks offer varied outdoor recreation and heritage appreciation opportunities. The park environments range from landscaped grounds with developed facilities to wildland areas with trails and primitive facilities. The Division also issues camping permits. (DLNR 2015)

DLNR Division of Aquatic Resources (DAR)

The DLNR Division of Aquatic Resources (DAR) manages and regulates the state's marine and freshwater resources through programs in commercial fisheries and aquaculture; aquatic resource protection, enhancement, and education; and recreational fisheries. Major program areas include projects to maximize commercial fishery and aquaculture productivity, protect native and resident aquatic species and their habitats, and provide facilities and opportunities for recreational fishing consistent with the interests of the state. DAR also issues fishing licenses. (DLNR 2015)

DLNR Division of Boating and Ocean Recreation (DOBOR)

DOBOR is responsible for the management, administration, and regulation of statewide ocean recreation and coastal area programs pertaining to the ocean waters and navigable streams of the state (exclusive of commercial harbors), which includes 21 small boat harbors (such as He‘eia Kea Small Boat Harbor), 54 launching ramps, 13 offshore mooring areas, 10 designated ocean water areas, 108 designated Ocean Recreation Management Areas (ORMAs), associated aids to navigation throughout the state, and beaches encumbered with easements in favor of the public. DOBOR is also responsible for the registration of small vessels. (DLNR 2015)

DLNR Division of Forestry and Wildlife (DOFAW)

DOFAW is responsible for the management of state-owned forests, natural areas, public hunting areas, and plant and wildlife sanctuaries. Program areas include watershed protection; native resources protection, including unique ecosystems and endangered species of plants and wildlife; outdoor recreation; and commercial forestry. DOFAW also issues hunting permits. (DLNR 2015)

DLNR Office of Conservation and Coastal Lands (OCCL)

OCCL is responsible for overseeing approximately 2 million acres of private and public lands that lie within the State Land Use Conservation District. In addition to overseeing privately and publicly zoned Conservation District lands, OCCL is responsible for overseeing beach and marine lands out to the seaward extend of the state’s jurisdiction. (DLNR 2015)

DLNR State Historic Preservation Division (SHPD)

SHPD works to preserve and protect historic and cultural resources which link the past to the present. SHPD’s three branches: History and Culture, Archaeology, and Architecture, strive to accomplish this goal through a number of different activities. The SHPD’s statewide Inventory of Historic Properties contains information on more than 38,000 historic sites in Hawai‘i. Reviews of development projects are SHPD’s primary means of lessening the effects of change on historical and cultural assets.

The Burial Sites Program, the Certified Local Government Program, the Historic Preserves Program, maintenance of the Hawai‘i and National Register of Historic Places, SHPD’s Information and Education Program, and Inter-agency Archaeological Services are designed to promote the use and maintenance of historical properties for the education, inspiration, pleasure, and enrichment of Hawai‘i’s citizens and visitors (SHPD 2015).

DOH-Clean Water Branch (CWB)

The Department of Health (DOH) Clean Water Branch (CWB) is part of the Department's Environmental Management Division (EMD) which administers the State's surface water and groundwater quality assessment, management, permitting, and enforcement programs. The CWB, through its Polluted Runoff Control Program, develops and manages the state's nonpoint source (NPS) management program pursuant to Section 319 of the Clean Water Act (CWA). The other sections in the CWB include the monitoring and analysis, engineering, and enforcement and compliance sections. These sections monitor water quality, prepare integrated reports every two years (pursuant to Sections 305(b) and 303(d) of the CWA), administer and enforce the NPDES permit program for point source discharges and issue and regulate CWA Section 401 water quality certifications (DOH CWB 2015).

Hawai‘i Community Development Authority (HCDA)

The HCDA is a State agency that was established to supplement traditional community renewal methods by promoting and coordinating public and private sector community development. In 1991, HCDA acquired the 405-acre He'eia wetlands in a land exchange agreement. In 2011, HCDA gained official redevelopment responsibility over the He'eia Wetlands when the State Legislature created the He'eia Community Development District (CDD) under HRS § 206E-202. The He'eia Community Development District was established to facilitate cultural practices, culturally appropriate agriculture, education and natural resource restoration and management of the He‘eia wetlands. In 2010, the HCDA entered into a 38 year lease with Kāko‘o ‘Ōiwi to restore the He‘eia wetlands into a working agricultural and cultural district. In implementing the development district, HCDA was additionally charged to manage the area in alignment with the Honolulu Board of Water Supply's most current "Ko‘olaupoko Watershed Management Plan" and the City and County of Honolulu's most current "Ko‘olaupoko Sustainable Communities Plan" as well as consult with adjacent landowners, Ko‘olaupoko Hawaiian Civic Club, Kailua, Kahalu‘u and Kāne‘ohe neighborhood boards, to assist land users to manage their properties, work with federal, state, county and other agencies to ensure that infrastructural support is provided for the district, and provide opportunity for the restoration and implementation of sustainable, culturally appropriate, biologically responsible, or agriculturally beneficial enterprises.

‘Aha Moku Advisory Committee

The ‘Aha Moku Advisory Committee was established within the DLNR in 2012 to advise the chairperson of the Board of Land and Natural Resources on issues related to culture and land and natural resources management through the ‘aha moku system. The ‘aha moku system is a system of best practices based on indigenous resource management practices within specific moku boundaries to sustain resources and the community of that moku. These boundaries acknowledges the ahupua‘a and larger moku or districts of each island, the specific resources located within those areas, and the methodology necessary to sustain resources

and provide for the community. The ʻaha moku system fosters understanding and practical use of knowledge, including native Hawaiian methodology and expertise, to assure responsible stewardship and awareness of the interconnections of the clouds, forests, valleys, land, streams, fishponds and sea. The ʻaha moku system is based on native Hawaiian traditional knowledge that ensures a community consultation process focused on the health and welfare of natural and cultural resources in Hawaiʻi. Heʻeia is in the Moku of Koʻolaupoko and is represented by the Moku O Kakuhihewa (Oʻahu) on the advisory committee. The ʻAha Moku Advisory Committee will provide guidance for cultural and land management activities in the Heʻeia NERR. (DLNR 2015)

Kāneʻohe Bay Regional Council

The Kāneʻohe Bay Regional Council was established by HRS Chapter 200D to facilitate the implementation and periodic review of the Kāneʻohe Bay Master Plan. This plan mentions a NERR designation as a possible way that "Kāneʻohe Bay be recognized as a resource of local, national, and global significance, and that it be afforded, all or in part, protected area status with the primary goal being to attain effective management and conservation" (OP 1992). The council was also given the duties and functions to serve as a central coordinating clearing house of public and private activities in Kāneʻohe Bay, facilitate productive interaction between users of Kāneʻohe Bay and the general public, recommend research, studies, data collection and planning of activities designed to provide additional information on Kāneʻohe Bay, advise the State and County on matters regarding the use of Kāneʻohe Bay, and educate the public and users of Kāneʻohe Bay about problems and programs in the bay. One of the other important functions is to serve as a public advocate, initiate and maintain contact with public, private, county and state organizations, agencies and individuals engaged in activities in the bay, and establish a Kāneʻohe Bay fishing panel to monitor fishing activities in the Bay. The council is administratively established within the DLNR, chaired by the administrator of DAR, and meets quarterly. DAR is in the process of reinvigorating the council and scheduling regular meetings. The council will be a strategic partner to coordinate with the Heʻeia NERR and provide feedback on how programs and activities in the Heʻeia NERR affect other users in the Bay.

6.4.2.1 County Regulatory Agencies, Management Authorities, and Enforcement Entities

City and County of Honolulu, Honolulu Police Department (HPD)

HPD serves as the primary law enforcement agency for the entire island of Oʻahu (HPD 2013). The Chief of Police directs the operation and administration of the department and is responsible for preservation of the public peace, protection of the rights of persons and property, prevention of crime, detection and arrest of offenders against the law, enforcement and prevention of violations of state laws and city ordinances, and service of processes and notices in civil and criminal proceedings. The department's jurisdiction is the City and County of Honolulu. For police operations, the island is divided into eight patrol districts; each district is subdivided into sectors and beats. The department's

headquarters is in downtown Honolulu. A district station is found in Kāneʻohe near the He'eia NERR (HPD 2015).

All of the Heʻeia NERR is located entirely within the City and County of Honolulu, on Oʻahu. HPD provides routine local enforcement in the Heʻeia NERR, and the Honolulu Fire Department stationed in Kāneʻohe will provide fire protection and emergency response services. All applicable local ordinances and restrictions will be observed in the Heʻeia NERR. The site partners have good working relationships with county police and fire personnel, and those relationships are expected to continue after the Heʻeia NERR designation.

Department of Planning and Permitting (DPP)

DPP is responsible for the City and County of Honolulu's long-range planning, community planning efforts, administration and enforcement of ordinances and regulations governing the development and use of land, various codes pertaining to the construction of buildings, and city standards and regulations pertaining to infrastructure requirements. DPP oversees the protection and regulation of uses within the coastal Special Management Areas (SMA) on Oʻahu. Building and major resource disturbances require an SMA permit. Nearly the entire Heʻeia NERR is located in the SMA and its uses are thus regulated by the DPP (DPP 2015).

6.4.3 State Agency Statutes, Rules, and Regulations

The statutes, rules, and regulations that apply to resource conservation and management in the Heʻeia NERR are listed below by agency and topic. Additional descriptions on pertinent sections of each rule are provided in Appendix L.

Department of Land and Natural Resources

1. Kāneʻohe Bay Regional Council (HRS Chapter 200D)
2. ʻAha Moku Advisory Committee (HRS Chapter 171-4.5)

Office of Conservation and Coastal Lands

1. Conservation District (Title 13, Hawaiʻi Administrative Rules [HAR], Chapter 5)

Division of Aquatic Resources

1. Hawaiʻi State fishing regulations—General
    - Commercial bait license (HRS §188-45)
    - Commercial marine license (HRS §189-2.3)
    - Aquaculture license (HRS §187-3.5, HAR Chapter 13-74-43)

- Aquaculture facility license (HRS §187-3.5, HAR Chapter 13-74-43)
- Special activity permit (HRS §187A-6)
- Recreational bottomfish fishing vessel registration (HAR Chapter 13-94)
- Commercial fishing vessel registration (HAR Chapter 13-94)

2. Hawai‘i State fishing regulations—Site-specific
    - He‘eia Kea Wharf (HAR Chapter 13-188-36)
    - Coconut Island (HAR Chapter 13-188-36)
3. Fisheries resource management
    - Lay nets (HAR Chapter 13-75-12 (4))
    - O‘ahu aquarium life management (HAR Chapter 13-77-1)
4. Protected marine fisheries resources (HAR Chapters 13-83 to 95)
5. Protected freshwater fisheries resources (HAR Chapter 13-100)

Division of Boating and Ocean Recreation

1. Small boat harbors
    - Offshore Mooring Rules and Areas (HAR Chapter 13-235)
2. Boating [general] (HAR Chapters 13-240 to 245)
3. Ocean waters, navigable streams, and beaches
    - General provisions (HAR Chapter 13-250)
    - Local ocean waters (HAR Chapter 13-254)
    - Ocean recreation management rules (HAR Chapter 13-256)

Division of State Parks

1. Hawai‘i State Park System (HAR Chapter 13-146)

Division of Forestry and Wildlife

1. Threatened and endangered plants (HAR Chapter 13-107)
2. Indigenous wildlife, endangered and threatened wildlife, injurious wildlife, introduced wild birds, and introduced wildlife (HAR Chapter 13-124)

State Historic Preservation Division

1. Rules governing requirements for archaeological site preservation and development (HAR Chapter 13-277)
2. Rules governing procedures for Historic Preservation review to comment on HRS § 6E-42 Projects (HAR Chapter 13-284)

3. Rules of practice and procedure relating to burial sites and human remains (HAR Chapter 13-300)

Hawai‘i Community Development Authority

1. He‘eia Community Development District (HRS §§ 206E-202 to 205)

6.4.4 Federal Agency Regulations

U.S. Army Corps of Engineers

USACE regulates impacts on wetlands and navigable waterways, including discharges of fill material into water bodies and wetlands.

1. *Section 10 of the Rivers and Harbors Act of 1899* requires approval prior to the accomplishment of any work in, over, or under navigable waters of the United States, or which affects the course, location, condition, or capacity of such waters.

2. *Section 404 of the CWA* requires approval prior to discharging dredged or fill material into the waters of the United States.

   Waters of the United States (33 CFR Part 328) include essentially all surface waters, including all navigable waters and their tributaries, all interstate waters and their tributaries, all impoundments of these waters, all wetlands adjacent to these waters, and certain isolated wetlands.

3. *Section 103 of the Marine Protection Research and Sanctuaries Act* requires approval for the transportation of dredged material for the purpose of dumping it in ocean waters at disposal sites previously approved by EPA.

National Ocean and Atmospheric Administration

1. NOAA regulates the take of threatened and endangered marine species (50 CFR 222—General Endangered and Threatened Marine Species)
2. NOAA also regulates the take of marine mammals (50 CFR 216—Marine Mammals)

U.S. Fish and Wildlife Service

1. USFWS regulates the take of threatened and endangered species (50 CFR 17—Endangered and Threatened Wildlife and Plants)
2. USFWS also regulates the take of migratory birds (50 CFR 21 –Migratory Bird Permits)

6.5 Allowable and Unallowable Uses in the He‘eia NERR

This section describes, by major land or water component, the current allowable and unallowable uses in the He‘eia NERR. The allowable or unallowable uses are identified based on the existing specific rules and regulations of federal, state, and county regulatory agencies, including whether permits or licenses are required for the land use or activity. Designating the He‘eia NERR does not, in of itself, add new regulations on uses or activities within the boundaries, however, as a NERR, certain activities which are inconsistent with the purpose of the He‘eia NERR and its research programs may be prevented from occurring within the boundaries. Current and future uses will be discussed and evaluated as the different He‘eia NERR programs develop and priorities are identified for implementing actions compatible with the He‘eia NERR Program and the intent of this management plan. Updated descriptions of compatible uses will be incorporated into the management plan when it is updated in the future.

Hawai‘i Institute of Marine Biology—Moku o Lo‘e

Moku o Lo‘e is owned by the University of Hawaii Foundation and managed by UH, and UH policies pertain to visitor use and access to the island (see Section 7 for more details). The island is included in the general subzone of the State Land Use Conservation District, and use of Conservation District lands is regulated by HAR Chapter 13-5 and HRS Chapter 183C. These rules and regulations identify land uses that may be allowed by discretionary permit, and impose fines for violations. Moku o Lo‘e is also located in the county designated special management area (SMA). Any major facilities development or significant disturbance of important natural and cultural resources on the island would require a Conservation District Use Permit (CDUP) from DLNR and an SMA permit from the City and County of Honolulu.

Hawai‘i Marine Laboratory Refuge

The Hawai‘i Marine Laboratory Refuge consists of 64 acres of reefs and bay waters surrounding Moku o Lo‘e in Kāne‘ohe Bay, from the high-water mark on the island seaward to 25 feet beyond the outer edges of the reefs (Figure 6-1). It is unlawful to take any aquatic life from within the boundaries of the refuge; an exception is made for UH personnel employed in catching or taking aquatic life for scientific purposes. It is illegal to remove fish, shells, coral, or other living organisms from the water without a DLNR Special Activities Permit (HIMB 2015). In addition, it is important for the health of the reef that visitors do not step on the coral, nor disturb any research gear, instruments, or cages that they might find in the water. All authorized taking of aquatic life must follow minimum size and closed season restrictions for certain species, as well as gear restrictions and other applicable rules (DAR 2015).

Table 6-1. Types of Allowable and Unallowable Uses by Major Land/Water Components in He‘eia NERR

Allowable or Unallowable Land Use[1]	He‘eia NERR Land/Water Component					
	Moku o Lo‘e (HIMB)	Hawai‘i Marine Laboratory Refuge	State Marine Waters and Submerged Lands	He‘eia Fishpond	He‘eia State Park	He‘eia CDD
Dredging or filling of Wetland or Waters of the U.S.	Yes*	Yes*^	Yes*^	Yes*	Yes*	Yes*
Major Facilities (buildings) Development	Yes*	No	No	Yes*	Yes*^	Yes*^
Conduct Research Activities or Deploy Research Equipment	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*#
Scientific Collection or Destructive Sampling	Yes*	Yes*	Yes*	Yes*#	Yes*	Yes*#
Handling of Cultural Resources	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*#
Commercial Ocean Recreation Activities	NA	No	Yes*	No	Yes*	NA
Commercial Fishing	No	No	Yes*	No	Yes*	NA
Recreational Fishing	No	No	Yes	No	Yes	NA
Boat Moorage (>72 hrs)	NA	No	Yes*^	NA	NA	NA
Hunting	No	NA	NA	No	No	No

Notes:

HIMB = Hawaii Institute of Marine Biology

[1] Yes = Activity is allowed in this land/water component of He‘eia NERR. No = Activity is not allowed in this land/water component of He‘eia NERR. NA = Activity is not applicable in this He‘eia NERR component.

*License or permit required.

^Only in designated areas.

#Landowner or Lessee permission needed for activity or access

State Marine Waters and Submerged Lands

The marine waters of Kāneʻohe Bay are located in a State Ocean Recreation Management Area (ORMA) which is used for recreational and commercial purposes including fishing, boating, thrill craft riding, skiing, diving, snorkeling, swimming, eco-tours, and research. As is currently permitted by law, personal recreational activities such as snorkeling, kayaking, fishing, and paddling will be allowed throughout the Heʻeia NERR as described in HAR Chapter 13-256 Subchapter 1 and HAR Chapter 13-256-73. Commercial recreational activities will continue to be allowed only in designated zones as defined in HAR Chapter 13-256. Any and all permits required for activities in the Bay will continue to be required.

The commercial recreational activities permitted in the Heʻeia NERR according to HAR Chapter 13-256-73 include the following:

- Commercial thrill craft: allowed in Zone A restricted zone, also referred to as the Checker Reef commercial thrill craft zone;
- Commercial and recreational water ski and water sledding: allowed in Zone G restricted zone, a nonexclusive commercial water ski and water sledding zone;
- Commercial ocean water sports: allowed in Zone J restricted zone, a nonexclusive commercial ocean water sports zone. Zone J1 allows commercial water skiing and water sledding.

These zones are included in the buffer area of Heʻeia NERR, shown in Figure 1.5.

DOBOR also manages and regulates Heʻeia Kea Small Boat Harbor facilities in Kāneʻohe Bay which is located nearby. One of the four designated small boat mooring areas in the bay is located in the Heʻeia NERR (DOBOR 2015) (HAR Chapter 13-235). Boat mooring longer than 72 hours requires a permit from DOBOR. The boat mooring area is indicated in Figure 1.5.

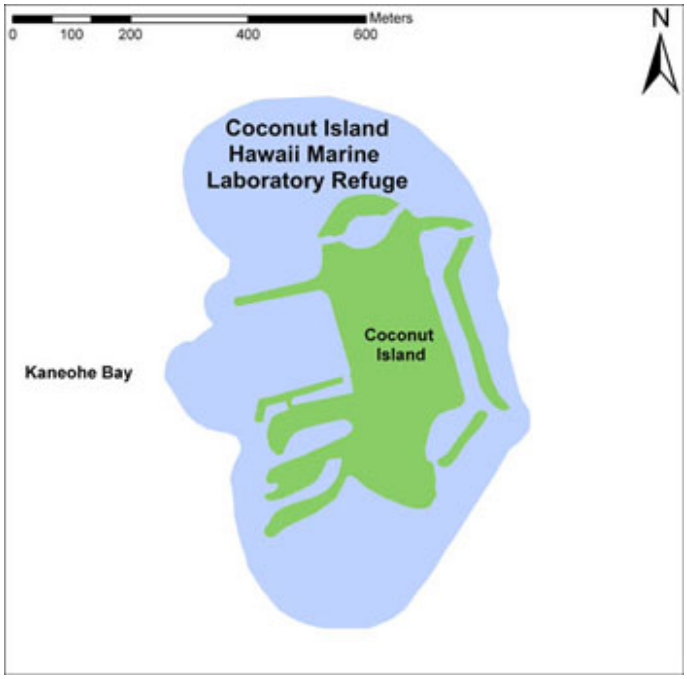

Figure 6.1. Coconut Island (Moku o Loʻe) Hawaiʻi Marine Laboratory Refuge – designated for research purposes

(Figure 6-1 map and table courtesy of DLNR-DAR website.)

Location:	The Hawaiʻi Marine Laboratory Refuge consists of the reefs and bay waters surrounding Moku o Loʻe, located in Kāneʻohe Bay, from the high-water mark on the island seaward to 25 feet beyond the outer edges of the reefs.
Prohibited:	It is unlawful to take any aquatic life from within the boundaries of the refuge.
Permitted:	The above restriction does not apply to any officer, faculty member, employee, or student of the UH, or licensee of the Board of Regents of UH, while employed in catching or taking of aquatic life for scientific purposes. All authorized taking of aquatic life must follow minimum size and closed season restrictions for certain species, gear restrictions, and other applicable rules.

Figure 6.2. Kayaking and stand up paddle boarding, some recreation activities allowed in the He‘eia NERR

(Photo Credit: Holokai Kayak & Snorkel Adventure)

Any development of facilities, permanent installation of research instruments, dredging, or filling of submerged state lands requires a permit from DLNR. Dredging or filling in marine waters requires a permit from USACE and a water quality certification from the Hawai‘i Department of Health.

Scientific collection or destructive sampling of aquatic flora, fauna, coral, or other living organisms may require permits issued by DAR. Scientific collection or destructive sampling of birds may require permits issued by DOFAW. Scientific collection or destructive sampling of federally protected species such as migratory birds, threatened or endangered species, or marine mammals may require permits issued by the USFWS or NMFS.

He‘eia Fishpond

He‘eia Fishpond is owned by Kamehameha Schools. It is a traditional aquaculture pond that is being repaired and managed by Paepae o He‘eia under a long-term lease from Kamehameha Schools in order to preserve the integrity of the fishpond and support a unique cultural, educational, and aquacultural program. Paepae o He‘eia staff, community volunteers, He‘eia NERR partners, and school groups work to restore and operate the pond using traditional aquaculture methods that avoid the use of heavy machinery. The program offers educational tours, workdays, and community harvesting of resources from the pond. Because the fishpond is on private property, public access is controlled by permission of the landowner or lessee. Educational tours and community access are scheduled by Paepae o He‘eia.

The property is in the resource subzone of the Conservation District, and in the City and County of Honolulu’s designated SMA. It is classified as a wetland. Any He‘eia NERR program development of facilities, permanent installation of research instruments, dredging, or filling of submerged state lands on

this property would require a CDUP from DLNR and an SMA permit from the City and County of Honolulu. Dredging or filling in the fishpond also would require a permit from USACE and the Hawai‘i Department of Health. Operation of the fishpond requires an aquaculture license and an aquaculture facilities license issued by DAR. Scientific collection or destructive sampling of flora, fauna, coral, or other living organisms from the pond may require permits issued by DAR or DOFAW. Scientific collection or destructive sampling of federally protected species such as migratory birds, threatened or endangered species, or marine mammals would require permits issued by USFWS or NMFS. Disturbance of cultural resources would require permits from SHPD.

He‘eia State Park

He‘eia State Park is an 18.5-acre park that is owned by DLNR as part of its state park system. The park is currently leased by Kama‘āina Kids, a private, nonprofit multiservice organization dedicated to serving children and their families through quality childcare programs (Kama‘āina Kids 2015a). The organization’s services include preschool programs, before and after school programs, environmental education programs, and enrichment programs, many of which are offered at He‘eia State Park. He‘eia State Park also has commercial use facilities, including a large visitor center where Kama‘āina Kids holds classes, a cultural gift shop, and a large banquet hall and outdoor pavilion that can be rented by individuals, families, and community organizations for meetings, lū‘au celebrations, weddings, and other special events. The park is open to the general public from 7:00 a.m. to 7:00 p.m., Monday through Sunday, per established operating hours (Kama‘āina Kids 2015b).

Any He‘eia NERR-related facilities development activities on state park lands would require a license amendment or special use permit issued by the Division of State Parks and/or DLNR. General park use and provision of public safety are regulated by state park rules (Division of State Parks 2015). Operation of the childhood education programs and community nature education, outreach, and ecotourism activities are managed by Kama‘āina Kids and authorized under license from the Division of State Parks. Any collection of or destructive sampling of flora, fauna, coral, or other living organisms may require permits issued by the Division of State Parks, DAR, or DOFAW.

He‘eia Community Development District (CDD)

HCDA obtained ownership of the He‘eia Wetland in 1991 in a land exchange agreement. In 2010, HCDA executed a 38-year lease for the area to Kāko‘o ‘Ōiwi, a Hawai‘i non-profit corporation. In 2011, the State Legislature established the He‘eia Community Development District (He‘eia CDD) with the mission to facilitate cultural practices, culturally appropriate agriculture, education and natural resource restoration and management of the He‘eia wetlands. Kāko‘o ‘Ōiwi is converting the currently fallow lands of Hoi (the He‘eia wetlands) into a working agricultural landscape (Townscape 2011a). The majority of the site is zoned urban but the He‘eia CDD statutes dictate that the site be used for cultural practices, culturally appropriate agriculture, education, and natural resource restoration and management of the He‘eia wetlands.

The upland forests are in the general subzone of the state Conservation District. Most of the agricultural lands and much of the upland forested area is in the City and County of Honolulu's designated Special Management Area (SMA). Much of the property is classified as wetland.

Kākoʻo ʻŌiwi staff, community volunteers, Heʻeia NERR partners, and school groups work to restore and operate the farmlands using traditional agricultural methods that avoid the use of heavy machinery. The program offers educational tours, workdays, and community restoration and management of taro loʻi. As semiprivate property, public access is controlled by permission of the landowner or agent. Educational tours, hiking, wildlife watching, and community access are scheduled by Kākoʻo ʻŌiwi.

Any construction of facilities, permanent installation of research instruments and scientific collection or destructive sampling, dredging, or filling of wetlands or disturbance of natural or cultural resources on Conservation District lands located on the site may require permits from SHPD, DLNR, HIDOH, City and County of Honolulu, USFWS or the USACE.

Section 7. Public Access and Visitor Use Plan

The public access and visitor use plan is a required element of a NERR management plan, per Code of Federal Regulations 15 CFR 921.13. Public access can be defined as the ability of all members of the community to pass physically and visually to, from, and along the ocean shore, other waterfronts, and over public lands. A public access plan must try to allow long-term public use and enjoyment of the water and shoreline while minimizing damage to the resources.

This plan will support the public access and visitor-use related objectives and strategies listed below and identified in the He‘eia NERR Strategic Plan.

He‘eia NERR Public Access and Visitor-Use Related Objectives and Strategies

Objective 3: Integrate traditional knowledge and research in the He‘eia NERR that will better reflect and inform community decision making toward creating a sustainable ecosystem.	**Strategy 3(b):** Coordinate periodic community meetings to inform the community about upcoming scientific research opportunities, gather input to guide further research, and share ongoing research results.
Objective 4: Increase student, educator, and community understanding of estuaries in general and in particular Hawaiian estuaries, coastal habitats, and the ahupua‘a land management system.	**Strategy 4(f):** Provide site-specific educational experiences that facilitate hands-on exploration of the upland, estuarine, and marine environments in the He‘eia estuary with site partners.
Objective 7: Engage and educate the community on the practices and values of the ahupua‘a land management system; in other words, promote ‘āina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.	**Strategy 7(a):** Provide a variety of hands-on stewardship experiences to the community groups and visitors.
Objective 9: Develop the tools, capacity and connections to increase public awareness across the community, island, state, nation, and the world of the	**Strategy 9(a):** Engage with site partners and other organizations such as local civic clubs to

ecological and cultural significance of the Heʻeia estuary and ultimately the entire ahupuaʻa of Heʻeia.	implement public outreach activities in the Heʻeia ahupuaʻa.

7.1 Public Access and Visitor Use at Heʻeia NERR

Public access is important to achieving the Heʻeia NERR's vision of conserving and sustaining coastal areas for future generations. Public access allows for recreational and educational opportunities that promote the image of the Heʻeia NERR and increase visitor appreciation and understanding of natural resources. Public use of the Heʻeia NERR will provide opportunities to develop and strengthen connections with local communities and to promote awareness and stewardship of coastal resources.

Public access, according to the landowners' policies regarding access, for commercial and recreational uses of the Heʻeia NERR will continue, and are supported by the roadways, trails, boat launch, piers, and docks in and adjacent to the Heʻeia NERR and identified under "Current Facilities," in Figure 7.1. Additional public access facilities are available in the Heʻeia Kea Small Boat Harbor and private marinas located adjacent to the Heʻeia NERR in Kāneʻohe Bay. Adequate water access is critical to facilitating and conducting research and monitoring in the marine portions of the Heʻeia NERR. Also, public boat ramps and trails are an important infrastructural improvement that will be used in many of the research, education, and stewardship programs and projects.

15 CFR 921.13(a) requires planning for public access as part of a NERR management plan. Table 7-1 provides a summary of current public access points and uses in the Heʻeia NERR and the major physical components of the Heʻeia NERR. Public access to the Heʻeia NERR will be determined by, and be compatible with, the public access policy of each of the agencies and site partners that have title to or management responsibility for the lands (i.e., HIMB, DLNR, Kakoʻo ʻŌiwi and Paepae o Heʻeia). Specific policies regarding access for education, stewardship, research, and monitoring will be determined through coordination with each of the Heʻeia NERR site partners and the RAB. Access to public lands for fishing, recreation, and gathering will not be impeded in any way by the Heʻeia NERR designation.

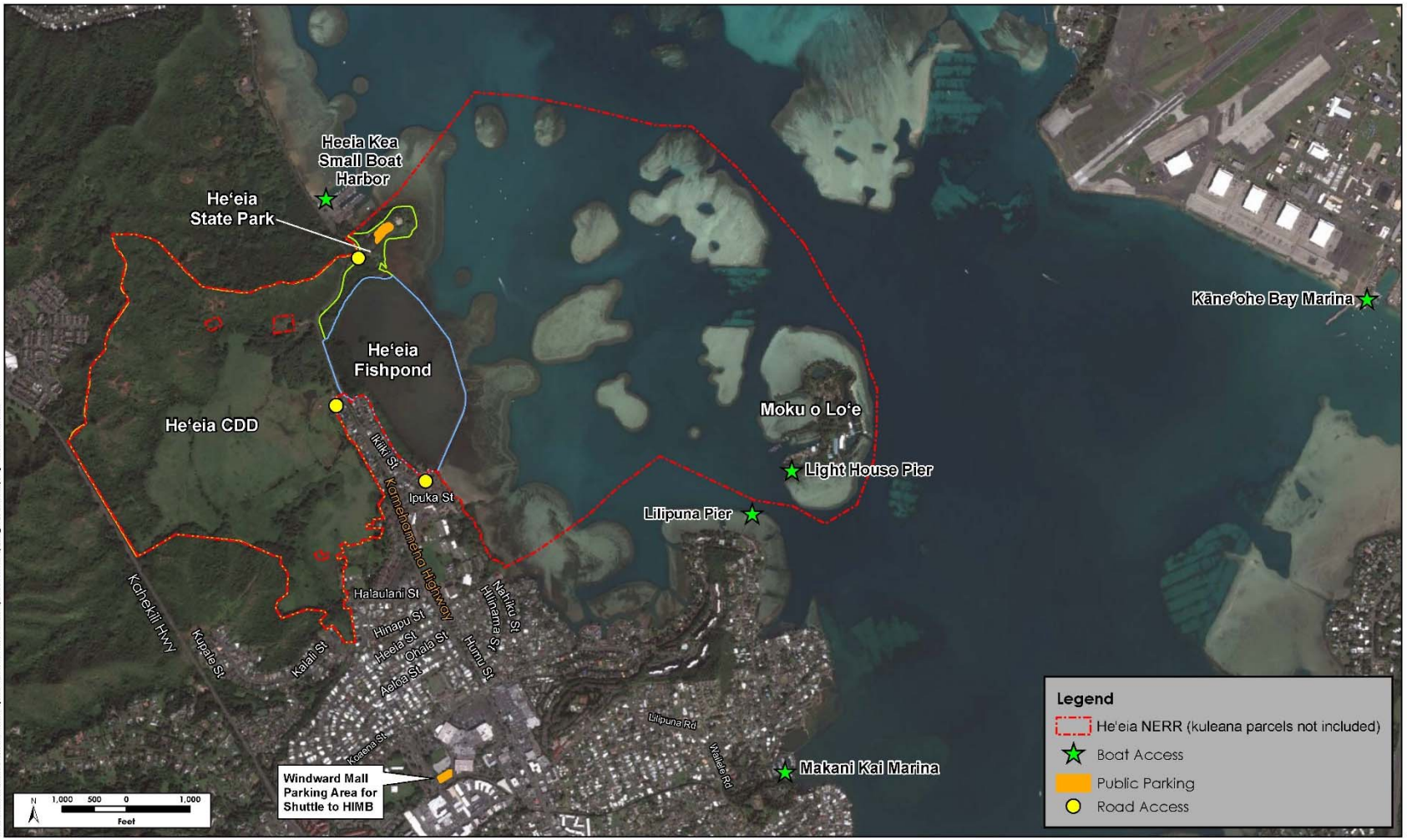

Figure 7.1. Current Public Access at He'eia NERR

7.2 Description of Public Access Points to the He‘eia NERR

The main road access to the He‘eia NERR is Highway 830 (Kamehameha Highway), which runs north-south along the coast through Kāne‘ohe (Figure 7-1). USACE designated navigation channels run through Kāne‘ohe Bay just outside the He‘eia NERR boundary (NOAA 2015). Marine transport in the He‘eia NERR includes the marine taxi that runs to Moku o Lo‘e from Lilipuna Pier (HIMB 2015). Public access to the marine waters of the He‘eia NERR for recreational and commercial small boat traffic will be provided by the He‘eia Kea Small Boat Harbor and boat ramp. The harbor has berths, moorings (some of which are located in the He‘eia NERR boundary), three boat ramps, fish host, Marine Sanitation Device pumpout, anchorage by permit (some are located within the He‘eia NERR boundary), vessel washdown, a harbor office, restrooms, showers, fuel, food, and ice. Access to the marine waters of the He‘eia NERR can also be gained from the Kāne‘ohe Bay Marina on Marine Corps Base Hawai‘i; the Makani Kai Marina, and from the Kāne‘ohe Yacht Club (not shown). Researchers working with HIMB will continue to access marine waters using the docks, piers, and boat facilities on Moku o Lo‘e. Public tours of the research facilities and island, led by docents, will continue as part of the education and outreach efforts of the He‘eia NERR.

Access to conduct administrative business will be via HIMB. The He‘eia NERR administrative office will initially be located on Moku o Lo‘e, co-located with the HIMB administrative offices. Visitors to Moku o Lo‘e must have a He‘eia NERR sponsor or an HIMB sponsor and complete a visitor waiver form prior to arrival. Special events will be arranged and sponsored by the He‘eia NERR staff. Access to Moku o Lo‘e is via 1-minute shuttle boat ride to the Light House Pier on the island from the Lilipuna Pier, located outside the He‘eia NERR boundary on the Kāne‘ohe Bay shoreline. Most educational boat tours through HIMB depart from He‘eia Kea Small Boat Harbor. Public parking is available at Windward Mall in Kāne‘ohe, and HIMB provides a shuttle service from Windward Mall to Lilipuna Pier. The administrative hours of HIMB (and the He‘eia NERR) are 7:00 a.m. to 5:30 p.m. on weekdays, and 8:00 a.m. to 5:00 p.m. on weekends. Regular weekday shuttle boat service operates from the Lilipuna Pier to the Light House Pier. Special arrangements would need to be made for off hours transport. As visitor use facilities are developed for the He‘eia NERR, it is anticipated that He‘eia State Park, with its ample parking and visitor use facilities, will become the point of entry for visitors to the He‘eia NERR and provide administrative office space and an operational base for He‘eia NERR staff members.

7.3 Permitted Public Uses at He‘eia NERR

The following paragraphs outline access to and appropriate uses of state lands and waters and the He‘eia NERR uplands. All of the uses described below contribute to community access to the NERR and provide opportunities for education and increased public awareness of issues related to the management of coastal resources.

Allowable uses in the He‘eia NERR will include both commercial and recreational activities (Table 7-1). Commercial and recreational fishing conducted per state regulations, as well as non-consumptive recreational

uses such as birdwatching, boating, kayaking, water skiing, diving, snorkeling, picnicking, and nature photography, will continue to be allowed in the He‘eia NERR and its waters. Public recreational uses of private lands in the He‘eia NERR are as outlined below and occur with the permission of the landowner. Commercial small boat traffic to facilitate ecotourism is regulated by DOBOR, and activities, uses, and permits are issued under its Ocean Recreation program (DOBOR 2015).

Table 7-1. Types of Public Access and Use by Major Land/Water Components in the He‘eia NERR

	Public Access and Uses[1]											
Major Component	**Commercial Ocean Recreation Activities**	**Commercial Fishing**	**Recreational Fishing**	**Boat Moorage (>72 hrs)**	**Diving/Snorkeling**	**Swimming**	**Beach Access**	**Wildlife Viewing**	**Hunting**	**Hiking Trails**	**Educational Tours**	**Group Meeting Facilities**
Moku o Lo‘e (HIMB)	NA	No	No	NA	NA	NA	Yes	Yes	No	Yes	Yes	Yes
Hawai‘i Marine Laboratory Refuge	No	No	No	No	Yes	Yes	NA	Yes	NA	NA	Yes	NA
State marine waters	No	Yes*	Yes	Yes*^	Yes	Yes	NA	Yes	NA	NA	Yes	NA
Ocean Recreation Management Area (ORMA) Zones	Yes*	Yes*	Yes	No	Yes	Yes	NA	Yes	NA	NA	Yes	NA
He‘eia Fishpond	No	No	No	NA	No	No	No	Yes	No	No	Yes	Yes
He‘eia State Park	Yes*	Yes*	Yes	NA	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
He‘eia CDD	NA	NA	NA	NA	NA	NA	NA	Yes	No	Yes	Yes	Yes
He‘eia Stream	No	Yes*	Yes*	No	Yes	Yes	Yes	Yes	NA	NA	Yes	NA

Notes:

[1] Yes = The He‘eia NERR component is accessible/appropriate for this use. No = The He‘eia NERR component is not accessible/appropriate for this use. NA = The public access or use is not applicable to this He‘eia NERR component.

*License or permit required.

^Only in designated areas.

Allowable commercial activities include boat mooring/anchorage under permit issued by DLNR’s DOBOR, commercial fishing under an individual commercial fishing license (for sale of personal catch), and commercial recreational tours under permit issued by DOBOR. These tours include water thrill-craft riding, skiing, and sledding; nature tours for snorkeling, diving, and nature viewing; fishing; kayaking; and boating. Also, commercial agricultural and aquacultural operations are carried out on the He‘eia CDD and in the He‘eia Fishpond. At the He‘eia State Park facilities, commercial use activities such as private parties, wedding receptions, meetings, ecotours, kayaking, boating, snorkeling, child care and early education are allowed under permit and fee from DLNR State Parks Division. Uses that are not allowed include entry without permission onto private (kuleana) lands which are not included in the He‘eia NERR and He‘eia Fishpond leased to Paepae

o He‘eia, and extraction of resources from the Hawai‘i Marine Laboratory Refuge surrounding Moku o Lo‘e (see Section 6.1.7 for restrictions).

If not listed in the paragraphs above, commercial uses of submerged lands and bay waters within the He‘eia NERR boundaries are prohibited unless approved by a permit issued by DLNR.

The He‘eia NERR will have no law enforcement jurisdiction; it will rely on DLNR and City and County of Honolulu law enforcement agencies to enforce regulations pertaining to public safety, traffic, hunting, fishing, boating, and other activities.

On public lands and waters, the He‘eia NERR will not impose restrictions or use restraints on outside researchers, but permits may be required by DLNR, USFWS, and/or NOAA for destructive sampling or collecting of plants or vertebrates. Access to and research on all lands in the He‘eia NERR will require the permission of the landowners or their agents.

7.3.1 Public Access Challenges

Public access to portions of the He‘eia NERR is controlled or limited due to the nature of landownership and/or the activities occurring there. The He‘eia Fishpond is private property leased to Paepae o He‘eia, who has the right to control access to protect its facilities and aquacultural products. Kako‘o ‘Ōiwi leases the He‘eia CDD from HCDA and has the right to control access to protect its facilities and agricultural products. Public use of private property introduces the possibility that someone may be hurt while visiting and sue the private landowner or operator for damages, a risk that many private landowners are reluctant to take. To protect against potential suit, both operators allow access at special events or by invitation, and require visitors to sign a waiver of liability to come onto the property. Access is also limited at HIMB. Similarly, because of the need to protect sensitive research equipment, facilities, and sites, HIMB requires visitors to have a He‘eia NERR or HIMB sponsor and sign a waiver of liability.

The He‘eia NERR designation does not supersede the landowners’ or lessees’ rights to control or restrict access to their property. He‘eia NERR education, research, and restoration activities requiring access to the fishpond, He‘eia wetlands, and HIMB will require advanced planning, coordination and communication between the site partners, He‘eia NERR staff and the public. Visitors to the He‘eia NERR will need to sign liability waivers, and be aware of and adhere to the He‘eia NERR tour rules and public access hours.

7.3.2 Public Access and Visitor Experience Opportunities

There may be increased opportunities for the public to access the area after the He‘eia NERR is designated. This could include centralized access through He‘eia State Park, where people could park their vehicles and possibly walk to the site partners facilities. There could be an organized annual open house, announced through a public notice, where there would be guided tours of each facility. Access could be provided independently by the site partners. The He‘eia NERR management plan calls for more hands-on experiences for the public,

and this is another opportunity for managed visitor access that is consistent with He‘eia NERR management plan goals and objectives.

Section 8. Facilities and Infrastructure Development and Improvement Plan

The He‘eia NERR facilities provide functional space for He‘eia NERR work and programming, as well as serve as a place for public interaction. When facilities are developed, they should be planned as sustainable facilities. The He‘eia NERR is responsible for providing the facilities necessary to fulfill the He‘eia NERR’s mission and support its research, education, cultural, and natural resource stewardship and training programs.

8.1 Current Facilities and Infrastructure at He‘eia NERR

The following existing facilities at the various He‘eia NERR site partner properties will be used to meet He‘eia NERR mission goals and objectives (Table 8-1).

Table 8-1. Existing Facilities and Equipment at He‘eia NERR Site Partner Properties

HIMB	Paepae o He‘eia Fishpond	He‘eia State Park	He‘eia CDD
Administrative offices	He‘eia Fishpond	Visitor center/gift shop	Maintenance buildings
Classroom, library, and laboratory buildings	Education pavilion	Exhibit hall	Education pavilion
Maintenance sheds	Office	Banquet hall	Maintenance roads
Housing for students and faculty	Caretaker’s residence	Canoe hale	
Research tanks and pens	Restrooms	Outdoor pavilion	
Docks/piers (Light House Pier on Moku o Lo‘e)	Equipment and storage	2 boat launch sites	
Human-made lagoons	Parking (11 stalls)	Caretaker’s residence	
Six 17’ whalers Two 22’ whalers	Aquaculture holding tanks	Maintenance buildings	
Honu Kai (vessel cap. 40)	Water filtration system	Parking lot (80 stalls)	
Community education program boat (cap. 49)		Beach and shoreline access	
		Hiking/walking trail	

Figure 8.1 Facilities and Infrastructure in He‘eia NERR

The administrative offices for the He‘eia NERR will initially be located at the HIMB campus on Moku o Lo‘e. This will provide a base of operations and logistics support to get the He‘eia NERR programs started. The location and layout of facilities at the HIMB campus are detailed in Figure 8-2.

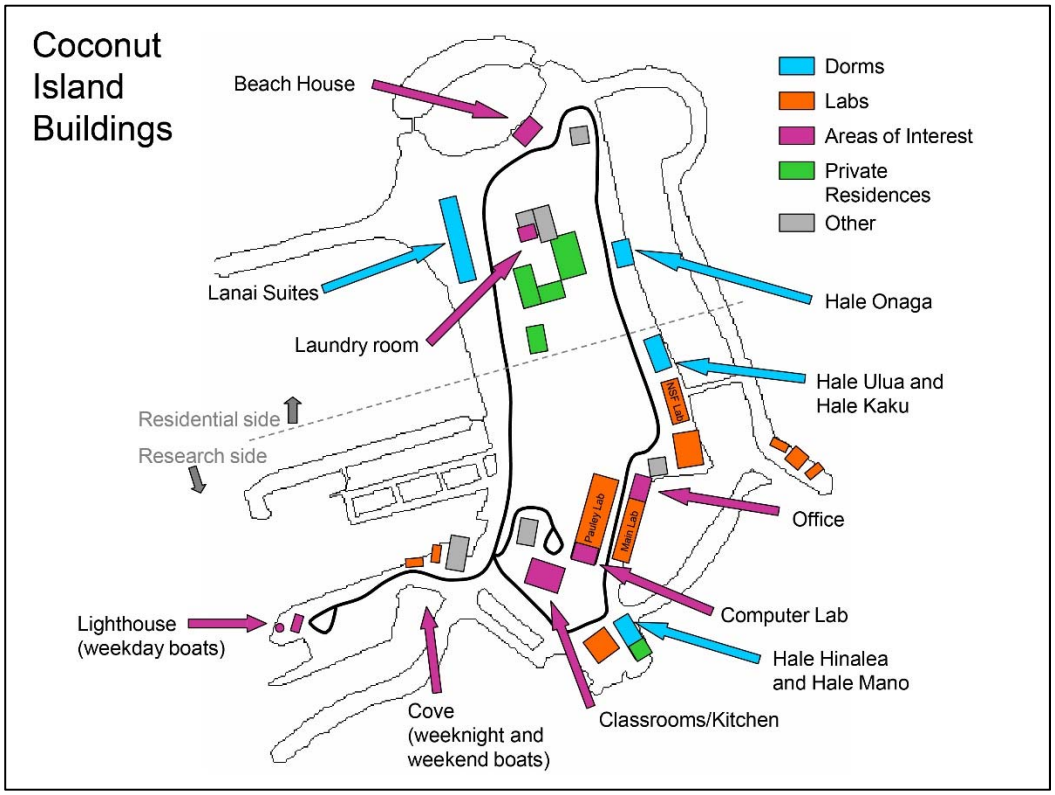

Figure 8-2. HIMB facilities on Moku o Lo‘e (Coconut Island)

(Map provided by HIMB)

HIMB has a number of vessels for use by research and education personnel as well as visiting groups. For educational programs, vessels usually provide access to the reefs departing from He‘eia Kea Small Boat Harbor. The HIMB fleet includes six 17' Whalers (capacity 7 people), two 22' Whalers (capacity 10 people), vessel named Honu Kai (capacity 40 people), and a community education program boat (capacity 49 people).

It is anticipated that He‘eia State Park, with its public parking lot and visitor-use facilities, will become one of the main points of entry for visitors to the He‘eia NERR (Figure 8-3). The park currently has ample parking spaces and room for cars, vans, and buses, which will bring visitors, school groups, and tourists to the site. The park also has ample room for development of a community education, research, and visitor center for the He‘eia NERR. While these visitor use facilities are being developed, it is anticipated that HIMB will provide interim office space and an operational base for the Education Coordinator and other He‘eia NERR staff.

8.2 Facilities and Infrastructure Challenges and Gaps

As the He‘eia NERR grows during its first 5 years of operation, these existing facilities will likely need to be improved or expanded upon to adequately meet growing program needs. Items like dedicated office space, additional storage, expanded laboratory and educational facilities, and increased community meeting space may be needed.

Table 8-2. Standard Reserve Facilities Configuration

Administration and Support	Research	Education
Offices and meeting space 2,925 ft^2	Laboratory 2,453 ft^2	Exhibit and reception 2,061 ft^2
Kitchen 376 ft^2	GIS operations 177 ft^2	Offices 640 ft^2
Storage 1,206 ft^2	Office 789 ft^2	Classroom 1,321 ft^2
Restroom 584 ft^2	Outside storage 1,317 ft^2	Storage 253 ft^2
Maintenance 2,159 ft^2	Inside storage 428 ft^2	Library 306 ft^2
Other 2,321 ft^2	Dorms 1,846 ft^2	Auditorium 1,116 ft^2
	Other 1,350 ft^2	Other 1,193 ft^2

Note: ft^2 = square feet.

Table courtesy of University of Wisconsin-Extension

A list of typical facilities needed to support the basic requirements of reserves is used by many new reserves for planning purposes (University of Wisconsin-Extension 2010). This list is based on a 2004 inventory and assessment of existing reserves. The standard reserve facilities configuration in Table 8-2 identifies the common facilities and average square footage at existing reserves and provides a basis for new reserves, such as the He‘eia NERR, to plan for long-term facility needs. The He‘eia NERR may use this information while conducting the long-term facilities assessment.

A facilities challenge for the He‘eia NERR is the lack of large, dedicated meeting and teaching space to support larger school groups and community groups for the education program. These need to be in a location that is convenient for public access and parking, including school buses. The He‘eia State Park has large meeting rooms that can be used for education, and also has ample parking, but is already in use by Kama‘āina Kids for early child care, youth and community education programs. There are two outdoor education pavilions at Kako‘o ‘Ōiwi and Paepae o He‘eia, but both are small and temporary and lacks sufficient parking at each site. HIMB has larger facilities, but parking and access to Moku o Lo‘e is challenging due to the required arrival by small shuttle boat.

Another facilities challenge is adequate space for administrative and program staff in a location accessible to the public. The He‘eia NERR core staff, i.e. the Reserve Manager, Research Coordinator, and Education Coordinator, will be located at HIMB during the startup period of the He‘eia NERR. HIMB has limited space and there are logistics challenges of getting access to the island via the shuttle boat. It also has limited public access. Having an office and baseyard facility located on Oahu, perhaps at the state park, would provide better

logistics for conducting field work at terrestrial sites in the He‘eia NERR, and provide greater accessibility to He‘eia NERR staff for site partners and the public.

Figure 8-3. He‘eia State Park Facilities

(Map courtesy of Kama‘āina Kids)

8.3 Planned Facilities and Infrastructure Development at He‘eia NERR

He‘eia NERR partners currently have facilities that will be available upon He‘eia NERR designation for NERR program needs, but additional facilities may be needed between 2017 and 2021, and in the long term to address future NERR program needs. During the first 5 years of operation, the He‘eia NERR will install the necessary SWMP infrastructure as well as evaluate future facilities’ needs and pursue solutions as feasible to enhance or develop facilities within the 5-year term; the He‘eia NERR also will develop a prioritized list of facility needs for the long term. As funds become available, facility development will proceed based on this list of priorities. All facilities will comply with federal, state, and local codes and regulations. In addition, any new facilities will be designed and constructed using sustainable building principles and in a manner that minimizes environmental impacts to the extent feasible, to integrate with and enhance He‘eia NERR educational and learning objectives.

He‘eia NERR staff and the RAB will identify future facility needs through a planning process. This process will provide details of what facilities will be needed and when, and will identify the site partner responsible for specific facility development. An analysis of the long-term future facilities needs will be explored during the first 5 years after designation. The analysis will identify facility needs which may include: a visitor center, office space, laboratories, classrooms, and equipment storage, which may be necessary for the successful operation of the He‘eia NERR. The analysis will also determine the extent to which the existing site partner facilities meet the He‘eia NERR’s needs. The He‘eia NERR site partners have a common desire for an interpretive facility that can serve as a visitor center, He‘eia NERR office and research and management base of operations, library, and repository for information about the He‘eia NERR.

Options that could be used to address facility needs include renovating existing He‘eia NERR site partner buildings or constructing new facilities on site partner’s properties. Development or expansion of new facilities will depend on agreed upon priorities and availability of funding and receipt of all required permits and approvals.

8.4 Climate and Non-climate Stressors

As He‘eia NERR staff and the RAB identify future facility needs through the planning process described above, they will include consideration of climate and non-climate stressors that may affect facilities. The types of stressors typically considered include climate change, environmental impacts, social impacts and feasibility. In 2010, NOAA developed a framework for considering climate change impacts in planning and decision making for coastal investments in restoration, facilities development, and land acquisition. The climate stressors pertinent to He‘eia NERR facility development planning should include changes in relative sea levels, changes in storm intensity, and changes in precipitation patterns. The non-climate stressors should include other natural hazards (tsunami, flood, fire, rockfall, and erosion), considerations of environmental impacts,

ability to meet program needs, and sustainability of use including lifespan. Consideration of these stressors will be incorporated into the planning process described above.

The He‘eia NERR Staff and the RAB planning process will use the facilities planning tools developed for the NERRS program including the guide for “Planning for Sustainable Facilities” (NOAA 2013). This tool has guidance on incorporating climate change impacts and green or sustainable building practices that are environmentally responsible and resource efficient throughout a building’s life-cycle, from siting to deconstruction.

Some of the considerations for siting to avoid potential climate change impacts at the He‘eia NERR site include the reality that most of the land within the He‘eia NERR is either a low island, or at elevations less than 20 feet along the shoreline or just inland. Some of the highest ground in the He‘eia NERR is at He‘eia State Park at 57 feet elevation. These coastal locations are susceptible to a combination of sea level rise and increased storm surge hazards related to climate change. In considering these factors, the site partners identified He‘eia State Park as a potential site to consider in the planning process for visitor center development. This will need to be further evaluated during the facility planning process.

Section 9. Land Acquisition Plan

In many estuaries in Hawai‘i, human development has significantly eliminated or degraded the coastal habitat. In the case of the He‘eia NERR, there is another important cultural consideration for future land acquisition. A key vision of the community in designating the He‘eia NERR is for it to be restored and managed as a traditional ahupua‘a. This will involve adding additional lands to the He‘eia NERR by appropriate means, the easiest of which is a willing landowner voluntarily dedicating their land’s inclusion in the He‘eia NERR under a cooperative agreement. “Land Acquisition” is the term used in the NERRS to describe the process to add lands to the He‘eia NERR. This plan will support the land acquisition-related objectives and strategies listed below and identified in the He‘eia NERR Strategic Plan.

He‘eia NERR Land Acquisition-Related Objectives and Strategies

Objective 1. Baseline environmental data informs researchers’ understanding of the magnitude of changes in the various He‘eia ecosystems.	**Strategy 1(f)**: Create opportunities to conduct research within the ahupua‘a, potentially outside the He‘eia NERR boundaries, that provides relevant information about impacts on the entire ahupua‘a of He‘eia, to inform the long-term vision of a healthy He‘eia ahupua‘a.
Objective 4. Increase student, educator, and community understanding of estuaries in general and in particular Hawaiian estuaries, coastal habitats, and the ahupua‘a land management system.	**Strategy 4(e):** He‘eia NERR staff develop programs that incorporate information about the entire ahupua‘a of He‘eia.
Objective 10. Support restoration of key areas in the He‘eia NERR to improve habitat and increase ecosystem services.	**Strategy 10(b).** Revise land acquisition and habitat restoration projects, taking into account climate change impacts.

9.1 Description of Potential Acquisition Areas

One of the visions of the community in designating the He‘eia NERR is for it to be restored and managed as a traditional ahupua‘a system with its ecological, cultural, social, and economic benefits to the community. To realize that vision, the boundaries of the He‘eia NERR would need to be extended farther upstream and encompass additional lands in the upland portions of the ahupua‘a that make up its upper watershed and include

the headwaters of He‘eia Stream. The parcels listed in Table 9-1 and shown in Figure 9-1 were identified in the public scoping or management plan development process; and the site partners and members of the community support investigating the potential for these parcels to be incorporated into the He‘eia NERR in the future. Each potential parcel’s contribution to the research that is done within the He‘eia NERR would be evaluated in light of restoration and manipulation results in the He‘eia NERR in order to consider the benefits from expanding the He‘eia NERR to include certain parcels. The potential areas include 4 large parcels in the upper portion of the ahupua‘a of He‘eia that contain important watershed forests and the headwaters of He‘eia Stream, the forested hillside area above the He‘eia Kea Small Boat Harbor, and the He‘eia Kea Small Boat Harbor itself. Adding the He‘eia Kea Small Boat Harbor was suggested so that additional public harbor facilities could be incorporated into the He‘eia NERR to ensure and improve public access to marine portions of the He‘eia NERR. If all the sites listed in Table 9-1 were added, the He‘eia NERR would increase in size by 1,076 acres.

9.2 Priority Areas Acquisition Strategy

9.2.1 Tract Acquisition Strategy

The vision to expand the He‘eia NERR to encompass the traditional ahupua‘a recognizes the unique opportunity provided by the He‘eia NERR to represent an entire watershed, from the stream’s mountain origin to the estuary and ocean, with its reefs and marine habitats which accept the fresh water.

To expand the boundary to include more of the traditional ahupua‘a, parcels will be considered that are under adequate state or local government control and for which the appropriate uses would be consistent with the goals and objectives of the He‘eia NERR. These publicly owned lands must meet the criterion of being under “state or local government control” and be eligible to add to the He‘eia NERR. The lands could be added to the He‘eia NERR by the current owner agreeing to add their lands to the He‘eia NERR and entering a cooperative agreement with UH, or by executing a land transfer or land exchange to one of the He‘eia NERR state agency partners. The success of restoration and manipulation activities within the He‘eia NERR will be considered and the results from ecosystem-based management (EBM) strategy monitoring taken into account when evaluating potential acquisition areas.

9.2.2 Climate and Nonclimate Stressors

Acquisition planning typically involves assessing anthropogenic and natural stressors, to inform the prioritization and selection of land acquisitions. Types of stressors typically considered include the threat of development, invasive species, and land zoning. Climate-related stressors have not been commonly factored into these processes. In 2010, NOAA developed a framework for considering climate change impacts in planning and decision making for coastal investments in restoration, facilities development, and land acquisition. That framework states that new or updated acquisition plans that are part of NERR management plans must integrate climate considerations. The climate stressors pertinent to the He‘eia NERR are changes in relative sea levels, changes in storm intensity, and changes in precipitation patterns.

Table 9-2 summarizes the climate and nonclimate stressors relevant to the Heʻeia NERR land acquisition strategy and prioritization. The parcels being considered were assigned a relative score based on the potential for the acquisition to have no effect, a positive benefit, or a negative effect in relation to the stressor. The site with the highest positive score has the best attributes when considering a combination of climate and nonclimate stressors. Based on the stressors evaluated, the Department of Hawaiian Homelands (DHHL) and DOFAW upland watershed parcels and the City and County of Honolulu stream parcels would have the fewest negative considerations regarding climate and nonclimate stressors, and the Heʻeia Kea Small Boat Harbor would have the most negative considerations.

Table 9-1. Parcels for Consideration for Future Inclusion in the Heʻeia NERR

Parcel	Acreage	Landowner	Considerations	Attributes and Land Use Status
Forested Conservation Lands above Heʻeia Kea Small Boat Harbor	204 acres	City and County of Honolulu	Potentially developable land that the County may value and choose to retain	Local government-controlled parcel is partially zoned as preservation (P-1/P-2) and partially as residential (R-10); located outside the subwatershed (doesn't drain into Heʻeia Stream); flat area suitable for development.
Heʻeia Kea Small Boat Harbor	13 acres of water and a 1-acre pier	DLNR/ DOBOR	Multiple additional user groups to consider; traffic congestion and accessibility issues	State government controlled in conservation district, would provide additional access to bay for user groups; groups such as fishermen and tour operators already use the pier and boat launch.
Upland watershed parcel	259 acres	DLNR/DOFAW	Identified as an important watershed forest component of the ahupuaʻa. Parcel is part of state Waiāhole forest reserve (Ioleka'a section) with limited public access. The parcel is part of the Koʻolau Mountains Watershed Partnership (KMWP). Parcel could be added to Heʻeia NERR through cooperative agreement with DLNR.	State government controlled in conservation district; contains mixed native and introduced wet forest habitat being managed for watershed protection, water resources, biodiversity protection, cultural resources, and education as part of the larger KMWP management plan. Funding is limited with little active management in progress. Parcel is not contiguous with the Heʻeia NERR.

Parcel	Acreage	Landowner	Considerations	Attributes and Land Use Status
Upland watershed parcel	138 acres	Department of Hawaiian Home Lands (DHHL)	Identified as an important watershed forest component of the ahupuaʻa. Parcel is part of Koʻolau Mountains Watershed Partnership (KMWP) but management status is unknown; land may be added to Heʻeia NERR through cooperative agreement or by land transfer.	State government controlled in conservation district; contains mixed native and introduced wet forest habitat being protected for watershed values, contains extensive cultural sites such as burials and historical sites and a former Coast Guard OMEGA station; very good vantage point to view entire ahupuaʻa system; current oversight of the area is not active; no management plan is in place for these parcels; is not contiguous with the Heʻeia NERR.
Heʻeia Stream upland Parcels (2)	461 acres	City and County of Honolulu	Both parcels identified as important headwater stream components of the ahupuaʻa. Both are part of Koʻolau Mountains Watershed Partnership (KMWP) but management status is unknown; may be added to Heʻeia NERR through cooperative agreement or a land transfer may be possible between agencies; lower reaches of the stream flows through private land between the upper watershed and the Heʻeia NERR.	Local government controlled in conservation district; would provide additional monitoring/ research sites for upstream species and environmental conditions; parcels are not contiguous with the Heʻeia NERR.

Notes: DHHL = Department of Hawaiian Homelands; DLNR = Department of Land and Natural Resources; DOBOR = Division of Boating and Ocean Recreation; DOFAW = Division of Forestry and Wildlife

9.2.3 Tract Ecological and Programmatic Values

The parcels identified for possible future inclusion in the He‘eia NERR have many ecological and programmatic values. Most of the proposed additions would expand the He‘eia NERR within the traditional ahupua‘a, encompassing a greater portion of the He‘eia watershed. These additions would provide a more complete watershed and estuary system to research and monitor the ecosystem services provided by both manipulation and restoration activities within the He‘eia NERR. The various ecological and programmatic values for each potential parcel are summarized in Table 9-3.

9.2.4 Methods for Establishing State Control

According to the national reserve system federal regulations, a reserve must establish adequate state control over new areas acquired for inclusion in the reserve boundary. The various approaches to achieve state control include entering a management agreement for the site, regulation, less-than-fee simple property interest (conservation easement), fee simple property acquisition, donation, or a combination of these approaches.

All of the parcels identified for boundary expansion are public lands, owned or managed by state or local government agencies. These government owned parcels have the potential to be voluntarily added to the He‘eia NERR by entering into a Multi-Party Governance Charter with UH as the He‘eia NERR state partner. The current landowners would not lose ultimate control over their properties, but would agree to manage their lands consistent with the goals and objectives of the He‘eia NERR. Managing the lands in a way that is consistent with the goals and objectives of the He‘eia NERR would also improve the environmental conditions on the lands and provide secondary benefits of ecological services, and for the benefit of Native Hawaiians in the case of the DHHL parcel. The landowners would also be eligible to receive funding for implementing programs that protect and restore their lands, and for providing additional services to the public.

Figure 9.1. Parcels for Consideration for Future Inclusion in He‘eia NERR

Table 9-2. Climate and Nonclimate Stressors and Their Relative Impacts* on Land Parcels under Consideration for Acquisition

	Potential Acquisition Parcel			
	City and County of Honolulu Forested Conservation Lands above He'eia Kea Small Boat Harbor	**DLNR He'eia Kea Small Boat Harbor**	**DLNR DOFAW and DHHL Upland Watershed Parcels (2)**	**City and County of Honolulu He'eia Upland Stream Parcels (2)**
Site Characteristics				
Size (acres)	204	14	397	461
Habitat	Degraded lowland forest habitat	Developed public use facilities; nearshore reef and mud flat	Mixed native and nonnative watershed forest; DLNR parcel is designated critical habitat for 3 listed Hawaiian damselflies and 43 listed plants that occupy lowland wet habitat.	Stream course and parcels with mixed native and nonnative forest; designated critical habitat for 3 listed Hawaiian damselflies and 43 listed plants that occupy lowland wet habitat.
Elevation limits (feet above sea level)	20–718	0–20	280–2400	200–2000
Climate Stressors				
Sea level rise	1	-1	0	0
Storm intensity	-1	-1	-1	-1
Climatic factor of flooding	-1	0	1	1
Climatic factor of drought	-1	0	-1	-1
Nonclimate Stressors				
Threats of development	1	1	-1	-1
Exposure to visitor use impacts	-1	-1	0	0
Exposure to invasive species impacts	-1	-1	1	1
Ability to support key ecosystem features, habitat, and species	0	-1	1	1
Relative Stressor Score	-3	-4	0	0

***** The stressor factors are assigned a relative value, indicating a positive, negative, or no-effect impact to be considered in prioritizing land for acquisition. If the land is not affected by the stressor = 0 value, if positively affected by the stressor = +1 value, or if negatively affected by the stressor = -1 value. The relative priority ranking is sum of values across all stressors.

Table 9-3. Ecological and Programmatic Values of Potential Acquisition Areas

Area	Acreage	Landowner	Ecological Values/Habitats	Programmatic Values
Forested Conservation Lands above He‘eia Kea Small Boat Harbor	204 acres	City and County of Honolulu	Forested watershed; habitat suitable for native species restoration; empties into the He‘eia NERR and affects core marine areas; would add to buffer area of He‘eia NERR	Would add watershed area of the ahupua‘a of He‘eia to the He‘eia NERR, add cultural history and cultural sites, expand buffer area that, if managed properly, would reduce impacts on core marine areas, and provide additional sites for hiking and recreation
He‘eia Kea Small Boat Harbor	13 acres of water and a 1-acre pier	DLNR-DOBOR	Additional coral reef habitat; would add to buffer area of He‘eia NERR	Would provide additional public facilities for access to marine portions of He‘eia NERR; has infrastructure that would support public access for expanded educational, research, and stewardship projects
Upland watershed parcel	259 acres	DLNR-DOFAW	Forested watershed; contains upper reaches of He‘eia Stream; habitat suitable for native species restoration; critical habitat; would add to buffer area of He‘eia NERR	Would add watershed area of the ahupua‘a of He‘eia to the He‘eia NERR, appropriate site for stewardship projects; would add watershed areas appropriate for studying watershed dynamics that affect the core, would expand buffer area to protect the water quality and quantity flowing into the lower estuary, increased management would reduce impacts on core marine areas; would provide additional sites for hiking and recreation
Upland watershed parcel	138 acres	DHHL	Forested watershed; contains upper reaches of He‘eia Stream; habitat suitable for native species restoration; would add to buffer area of He‘eia NERR	Would add watershed area of the ahupua‘a of He‘eia to the He‘eia NERR and would add extensive cultural sites such as burials and historical sites; very good vantage point to view entire ahupua‘a system; has infrastructure that would support public access and expanded educational, research, and stewardship projects; increased management would reduce impacts on core marine areas would provide additional sites for hiking and recreation

Area	Acreage	Landowner	Ecological Values/Habitats	Programmatic Values
He‘eia Stream upland Parcels (2)	461 acres	City and County of Honolulu	Would add upper reaches of He‘eia Stream tributaries; habitat suitable for native species restoration; critical habitat; empties into the He‘eia NERR and affects core marine areas; would add to buffer area of He‘eia NERR	Would add monitoring and research sites for studying upstream species and conditions, and cultural history and cultural sites; would expand buffer area that increased management would reduce impacts on core marine areas; would provide additional sites for hiking and recreation

If an agency is reluctant or unable to enter into a Multi-Party Governance Charter, there are other ways to acquire land for the He‘eia NERR. For example, if DHHL is unable to dedicate lands entirely to conservation purposes, or is reluctant to commit to long-term management control and oversight by another state or federal agency, the exchange of another piece of property of comparable value is possible. DLNR and the City & County of Honolulu have land holdings that could be considered for such an exchange, which would be subject to their internal review and approval processes.

9.2.5 Fair Market Value Estimates

Because the land acquisitions discussed above primarily target state or local government lands, it is not anticipated that the properties would be purchased; rather, they would be provided voluntarily by the state or local government entity, or in an exchange for comparable lands where required. Therefore, fair market value estimates are not needed. If for some reason a land trade, actual sale, or other ownership transfer requires a fair market value estimate; such estimates will be developed as part of the investigation of the property.

9.2.6 Estimated Acquisition Timeline

All of the parcels identified for boundary expansion are public lands, owned or managed by state or local government agencies. Because these government lands have the potential to be voluntarily added to the He‘eia NERR through a cooperative agreement with UH, and not requiring any land exchanges or sale, the timeline to complete the process could be relatively short. It should take up to 1 year to develop the concept paper and reach out to the appropriate contacts in the state or county agency to introduce the idea. It may take a number of years for the agency to evaluate the proposal and reach a decision. The agency being asked to join the He‘eia NERR partnership may want to evaluate the success of the program before committing. Interest and support from the community will help in making the case for the target agency to join the He‘eia NERR partnership.

Section 10. Resource Manipulation

"Resource Manipulation" is the term used in the NERRS to describe human activities such as agriculture, commercial recreation, development and operation of research and public use facilities and infrastructure improvements such as harbors, roads, and utilities that modify the natural condition. In some cases these activities also provide important ecosystem services to the natural systems. When occurring within He'eia NERR boundaries, these manipulation activities should be compatible with the He'eia NERR's vision and mission and be limited in nature and extent to the minimum manipulative activity necessary to accomplish its stated research objective. The resource manipulation-related objectives and strategies identified in the He'eia NERR Strategic Plan are as follows.

He'eia NERR Resource Manipulation-Related Objectives and Strategies

Objective 1: Baseline environmental data informs researchers' understanding of the magnitude of changes in the various He'eia ecosystems.	**Strategy 1(j):** Establish a site experimental design that supports ecosystem-based management research approach.
Objective 6: Integrate traditional knowledge and contemporary science to effectively address climate change, habitat restoration, and water quality.	**Strategy 6(d):** Provide technical assistance to site partners in support of ongoing traditional agricultural (taro lo'i) and aquaculture (He'eia fishpond) practices.
Objective 7: Engage and educate the community on the practices and values of the ahupua'a land management system; in other words, promote 'āina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.	**Strategy 7(a):** Provide a variety of hands-on stewardship experiences to the community groups and visitors.
	Strategy 7(b): Collaborate with partners to incorporate He'eia NERR science, traditional knowledge and information in the rehabilitation of historical, agricultural and aquacultural resources within the He'eia NERR.

10.1 Overview of Current and Proposed Resource Manipulation at He‘eia NERR

There are a number of current and proposed resource manipulation activities within the He‘eia NERR. Conducting these activities in the He‘eia NERR is intended to support research into the changes in the He‘eia NERR ecosystem as evidenced by the ecosystem services provided by the areas being actively manipulated through agricultural and aquacultural activities. Using an ecosystem-based management (EBM) research framework, targeted ecosystem services affected by either the research-based manipulation activities or restoration activities (Section 11) will be evaluated and assessed over time to improve the long-term management and sustainability of the He‘eia NERR and a broad spectrum of Hawaiian estuarine environments. Examples of the ecosystem services which the manipulation activities are expected to provide include sustainable fishery stocks, soil and nutrient retention, species biodiversity and habitat enhancement, and flood protection.

Soil erosion, fertilizer and pesticide runoff, and animal waste can end up in streams, estuary and marine habitats, potentially damaging He‘eia NERR resources. Currently, the wetlands in He‘eia are overgrown and dominated by weeds and California grass, which provide very poor habitat for native birds and aquatic species and are susceptible to wild fires and erosion. Converting these habitats to organic lo‘i kalo is expected to result in a useful crop to feed the community, potentially mitigate climate and non-climate stressors, and offer the opportunity to understand how and to what extent the lo‘i kalo support multiple ecosystem services as listed in Table 1.8. For example, the rehabilitation of the lo‘i kalo is expected to open up habitat for native birds and aquatic species, retain soil and nutrients, clean groundwater, and restore water flow to the downstream wetlands and fishpond. In support of the effort to rehabilitate the lo‘i kalo, maintenance roads will be rehabilitated and water conveyances will be installed to properly manage these areas (See Figure 10.1).

He‘eia Fishpond, which is a long-term, preexisting use in He‘eia, is the recipient of fresh water from He‘eia Stream. Invasive mangrove and seaweed damage the walls and clog the pond, and are being removed to reestablish a sustainable food chain to support aquaculture production. The fresh stream water flows through the fishpond and out into the bay. If the fishpond is well managed and has a balanced system, it is expected to support ecosystem services as listed in Table 1.8, particularly improving water quality for estuarine and marine habitats, supporting both coral and fish in the bay and native and cultivated fish stocks in the pond. Rebuilding and maintaining the fishpond will strengthen it against impacts from climate-related stressors of sea-level rise and frequent more severe storms which may over-top the walls and damage this cultural resource. Controlling invasive mangrove and algae and improving water quality in the fishpond will help clean up this portion of the estuary and improve conditions on the adjacent reefs. Research and monitoring in the fishpond offer the opportunity to understand how and to what extent the activities in the fishpond support these multiple ecosystem services.

Without the current and planned agricultural and aquacultural rehabilitation efforts, the wetland and estuarine habitats in these areas would likely degrade further and deteriorate with neglect. The He‘eia NERR establishes the connections for site partners to communicate and share what is working right, and adaptively manage their respective sites to sustain operations without adversely affecting their neighbor or resources of the He‘eia NERR. If managed wisely, both the estuarine and marine systems will be healthy, and the resources and community they support will flourish. Moreover, from a cultural perspective, the lo‘i kalo and loko i‘a are traditional land uses in the ahupua‘a of He‘eia and these two site partners, Paepae o He‘eia and Kāko‘o ‘Ōiwi, are critical partners to realizing the community’s vision of the overall restoration of the ahupua‘a of He‘eia. These manipulation areas in the He‘eia NERR, coupled with the restoration activities discussed in Section 11, offer the opportunity to identify the ecosystem services provided by each management strategy and monitor the strategies’ success in creating a more resilient and sustainable estuary. Implementing these two strategies under the framework of a NERR is expected to enable He‘eia to provide significant insight into the effective management of estuarine systems in the insular biogeographic region.

10.2 Specific Resource Manipulation Activities at He‘eia NERR

The manipulation activities at He‘eia NERR are informed by management and conservation plans previously developed by site partners. The He‘eia NERR and site partners intend to work collaboratively toward implementing and expanding these projects over the years as planning and funding become available. The expansion of the manipulation activities would depend on their ability to contribute to answering the overarching research question of which management strategies enhance ecosystem services for the site, and would take place where adaptive management of the area is possible. As the He‘eia NERR programs are developed and implemented, He‘eia NERR staff and the RAB may adaptively manage the site according to the results of monitoring and research efforts which gauge the ecosystem services that these manipulation activities provide, and accordingly seek resources to support these activities.

The He‘eia NERR designation offers the chance to monitor and document the habitat changes and ecosystem services provided by manipulation and restoration activities. Monitoring these services, such as filtering and storing rainwater, will be valuable for informing research and adaptive management decisions in the area.

10.2.1 Kāko‘o ‘Ōiwi—Reconstruction of Wetland and Upland Traditional Landscapes

As part of its efforts to support traditional agricultural and according to their Māhuahua ‘Ai o Hoi Plan, Kāko‘o ‘Ōiwi is converting the currently fallow lands of Hoi (the wetlands within the He‘eia CDD) into a working agricultural landscape with organic lo‘i kalo in the wetlands (Townscape 2011a) (Figure 10-1). This area lies within the He‘eia NERR buffer. The He‘eia NERR’s role will support the efforts of Kāko‘o ‘Ōiwi by providing technical assistance, monitoring, establishing baseline conditions for research, and planning assistance.

Manipulation elements of the Māhuahua ʻAi o Hoi Plan include:

- Restoring the historic loʻi of Heʻeia to active production of organic taro;
- Practicing organic agriculture within existing agricultural areas;
- Practicing aquaponics in order to support educational goals and
- Restoring and maintaining the minimum extent of the historic agricultural and safety roads necessary to ensure access to the agricultural and restoration areas that are supporting the Heʻeia NERR primary research question and other activities;
- Restoring historic loko iʻa kalo, or traditional combined taro patches and fishponds, in the makai brackish areas of the wetlands;
- Managing sediment and debris to reduce impacts on agricultural areas and downstream areas; and
- Developing the necessary agricultural and community support facilities in upland areas, including an historic poi mill, community/education center, and maintain existing agricultural and community support infrastructure including a Hawaiian hale, base yards, and composting facilities.

Table 10.1 Current and Proposed Resource Manipulation Activities within the He‘eia CDD

Area	Manipulation Activity	Current or Proposed	Potential ecosystem services provided	Permissible basis
He‘eia CDD	Taro patches	Current/expansion proposed	Habitat for native birds, fish; soil and nutrient retention; clean groundwater; restore water flow; cultural traditions	Research purposes
	Combined taro and fishpond	Proposed	Habitat for native birds, fish; soil and nutrient retention; clean groundwater; cultural traditions	Research purposes
	Dryland agriculture	Current	Food security, cultural traditions, soil and nutrient retention	Research and education purposes
	Aquaponics	Current/expansion proposed	Support and repopulate native fish stocks and seaweed populations	Research purposes
	Maintenance roads and water conveyances	Current/expansion proposed	Support and enable rehabilitation and maintenance of the area	Support research purposes
	Community/education center	Proposed	Cultural traditions	Research and education purposes
	Historic poi mill	Proposed	Cultural traditions, food security	Research and education purposes

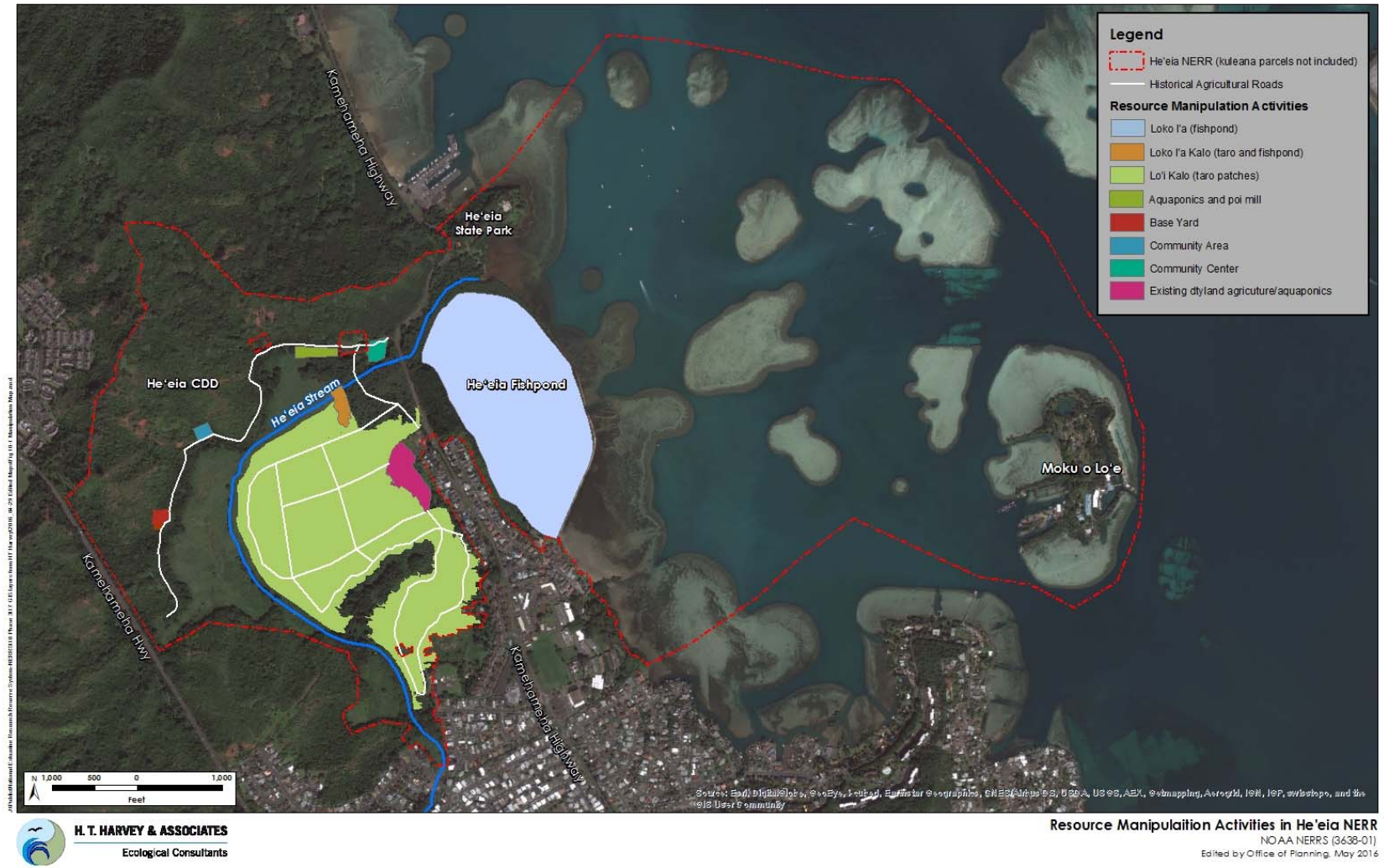

Figure 10.1 Manipulation Projects within the He‘eia NERR

Loʻi Kalo

The cultivation of loʻi kalo (taro patches) is a manipulation activity historically done in the area and will continue to be conducted within the Heʻeia NERR for research purposes. The rehabilitation of the loʻi kalo for research purposes offers the chance to enhance and monitor the ecosystem services provided by the wetland area which includes native wildlife habitat, soil and nutrient retention, clean groundwater, and restored water flow. Kākoʻo ʻŌiwi is the main site partner involved in the rehabilitation of the loʻi kalo and they receive guidance from the Koʻolaupoko Hawaiian Civic Club regarding historical activities in the area. Heʻeia NERR staff will support the efforts of Kākoʻo ʻŌiwi by providing technical assistance, monitoring, establishing baseline conditions for research, and planning assistance.

As part of the rehabilitation of organic loʻi kalo in the wetlands of Heʻeia, historic kuāuna (taro patch walls) have been identified by a certified archaeologist as part of an archaeological inventory survey and will be restored to the extent possible (Soltz et. al. 2014). New kuāuna will be constructed to replace kuāuna from earlier times that are no longer present. Kuāuna will be built by excavating soil from within the loʻi and using this soil to create the kuāuna. The loʻi kalo will be used to grow different varieties of taro and will also serve as habitat for native birds. In order to enhance the habitat benefits of loʻi kalo areas for native birds, Kākoʻo ʻŌiwi will also develop and implement a predator control program for rats, mongooses, cats, and dogs in cooperation with USFW and DOFAW. As recommended by USFWS, Kākoʻo ʻŌiwi will develop a plan for early identification and response to sightings of avian botulism in the area (Townscape 2011b).

Figure 10.2. Kākoʻo ʻŌiwi plans include the production of taro for food and enhancement of habitat for native species

(Photo courtesy of Kākoʻo ʻŌiwi)

Historical agricultural roads and ʻauwai (water conveyance channels) also remain in the wetlands of Heʻeia and will be identified through the archaeological inventory survey (some have already been identified). To the extent necessary to fulfill the research and restoration activities in the Heʻeia NERR, these roads will be rehabilitated and reinforced with geotextile material; the ʻauwai channels will also be restored and revegetated with native riparian vegetation. These roads and water conveyance infrastructure will enable the Heʻeia NERR staff and site partners to access the areas that are supporting the Heʻeia NERR's primary research question and other activities.

Additionally, the Heʻeia NERR partners are planning to reestablish historic loko iʻa kalo in the wetter parts of the wetlands in the makai portion of the property. The loko iʻa kalo which was historically present in the area will serve several purposes, including production of fish and taro for consumption, trapping of sediment during rain events, and provision of native bird habitat. Aquaponics, much like the loko iʻa kalo, will be used to cultivate and support fish stocks, which will then be placed in the stream. The aquaponics system will also support the growth of native limu. Water used for the aquaponics system will be well or tap water, and will not be taken from or added to the stream.

Following a hydrology and hydraulic study to better understand streamflow under various storm conditions, Heʻeia NERR in partnership with Kākoʻo ʻŌiwi may explore stormwater management options to help slow down stormflows and retain sediments and debris, which will minimize impacts on loʻi kalo and other wetland areas as well as the fishpond and bay.

10.2.2 Paepae o Heʻeia—Heʻeia Fishpond Reconstruction and Aquaculture Farming

Heʻeia Fishpond is a loko kuapā (walled fishpond) with a unique 7,000-foot-long wall that completely encircles the pond. Paepae o Heʻeia is a private non-profit organization that aims to rehabilitate the ancient kuapā (fishpond wall) and manage the fishpond to support a unique cultural, educational, and aquacultural program (Paepae o Heʻeia 2015). The fishpond is a long-term, pre-existing habitat manipulation activity in the area. It is anticipated that the rehabilitation and management of the fishpond may support enhanced ecosystem services such as native wildlife habitat including native seaweed restoration, and improved estuarine and marine water quality. It is expected that these rehabilitation and management activities, and the enhanced ecosystem services resulting therefrom, will support the overall research objectives of the Heʻeia NERR, and therefore, the Heʻeia NERR intends to support the efforts of Paepae o Heʻeia by providing technical assistance, monitoring, establishing baseline conditions for research, and planning assistance.

Table 10.2 Current and Proposed Resource Manipulation Activities within the He‘eia Fishpond

Area	Manipulation Activity	Current or Proposed	Potential ecosystem services provided	Permissible basis
He‘eia Fishpond	Fish cultivation	Current	Improve estuarine and marine water quality; repopulate native and cultivated fish stocks	Long-term pre-existing use
	Invasive mangrove and seaweed removal on fishpond wall	Current	Support native seaweed restoration to support native habitat restoration	Research purposes

Mangrove Removal

A vital part of the rehabilitation of the He‘eia Fishpond is to remove the invasive mangrove. Several species of mangrove grow in Hawai‘i, but the most prevalent near the fishpond is Rhizophora mangle (red mangrove), which grows in thick forests with tangles of aerial roots. Introduced to the He‘eia wetlands in approximately 1922 to control erosion and stabilize sediment, mangrove trees spread quickly through all parts of the fishpond and accelerated the process of silt buildup. Also, as the plant grows in the fishpond wall, its many aerial roots loosen the rocks and coral, undermining the wall’s structural integrity.

Mangrove removal efforts began in the late 1990s with the former fishpond lessee, Mary Brooks, with help from students from UH. Paepae o He‘eia began removing mangrove in earnest in 2001, using simple handsaws and loppers, and later chainsaws. Thousands of volunteers working tens of thousands of labor hours have been devoted to removing mangrove over the years. As of 2016, Paepae o He‘eia had physically removed mangrove from over 3,500 feet of the 7,000-foot-long kuapā.

Kuapā Rehabilitation

Once the larger mangroves are removed, the damaged portions of the wall can be reconstructed. In some areas, the wall is broken down to the niho (foundation) stones, and in other areas, only one or two rocks have fallen off the top. Paepae o He‘eia works with the same materials originally used to create the kuapā: pōhaku pele (volcanic rock) and ko‘a (coral). All invasive plants such as mangrove, pluchea (*Pluchea sp*.), pickleweed (*Batis maritima),* and other weeds will be removed to expose the bare wall.

Invasive Seaweed Removal

The removal of invasive limu (seaweed) is another manipulation activity that supports the long-term preexisting use of the fishpond. Removing the invasive limu improves the environment of the fishpond and enables the return of native seaweed (manauea and common ogo) as part of the habitat for native and cultivated fish stocks in the pond. The reef adjacent to He‘eia Fishpond is blanketed mainly by three species of invasive limu: *Kappaphycus* sp., *Acanthophora spicifera,* and *Gracilaria salicornia*. Fragments of these limu float into the pond during high tides and then establish themselves.

Paepae o He‘eia has removed invasive limu since 2004 with the help of community partners such as TNC, DAR, O‘ahu Invasive Species Council, and countless individual volunteers. Between 2004 and 2012, Paepae o He‘eia removed 50 tons of invasive limu from He‘eia Fishpond. The invasive limu is gathered by hand or net and placed into large bags. The limu is then used by mauka partners as fertilizer on their lo‘i kalo, ‘uala (sweet potato) patches, or any other type of garden. Paepae o He‘eia plans to continue with invasive species removal and reestablish a sustainable food chain in the fishpond to support aquaculture production.

Aquaculture Production

The use of the fishpond to produce aquacultural products is a long-term, pre-existing use of the area. Paepae o He‘eia plans to produce the aquacultural products listed below as part of a community-based economic development program to research, develop, and feature various products and services from the He‘eia Fishpond and make them available to the public. In doing so, the group hopes to mutually benefit both the fishpond and those whom it can nourish (Paepae o He‘eia 2015).

- **Moi (Pacific threadfin)—**Paepae o He‘eia has been successfully raising moi since 2006 and will continue to do so. The fish are offered for sale to restaurants and the public.
- **‘Ama‘ama (Striped or Grey Mullet)—**‘Ama‘ama is one of the historic fishpond species and an important food fish in ancient Hawai‘i. A very choice indigenous food fish that Paepae o He‘eia will continue to raise and offer for sale to restaurants and the public.
- **Limu as food (Gorilla ogo)—**Despite being an invasive pest, this seaweed is closely related to the native manauea and common ogo species that are commonly eaten. This product is not actively cultivated in the fishpond, but once removed as part of the invasive specie eradication efforts, it is offered for sale to restaurants and the public.
- **Limu as fertilizer—**Farmers have successfully used the invasive limu that grows in the fishpond to fertilize gardens and lo‘i. Individual farmers and members of the public are encouraged to gather limu themselves. If self-picked, limu is given away rather than sold.

- **Oysters (Pacific and Hawaiian)—**In collaboration with UH Hilo and the Pacific Aquaculture and Coastal Resources Center, Paepae o He‘eia is researching the survivability and growth rates of two species of edible oysters in He‘eia Fishpond.
- **Mangrove firewood—** Paepae o He‘eia occasionally gives away mangrove wood. The dense hard wood is useful as fuel for barbeques, imu, smoke houses, and other such purposes.
- **Mangrove wood for construction—**Mangrove wood is resistant to termites and bugs and can be used for hālau (meeting house) construction, hula implements, picture frames, lomi (massage) sticks, and other work. It is also given away rather than sold.



Figure 10.3. Aquacultural products from the He‘eia Fishpond include moi (Pacific Threadfin), limu (seaweed), and oysters

(Photo courtesy of Paepae o He‘eia)

The He‘eia Fishpond is intended to be a self-sufficient program that combines technical aquacultural operations with cultural and environmental educational activities and sustainable, community- based economic development initiatives. Paepae o He‘eia has also established an ecocultural educational program with hands-on research and learning activities. The group works with individuals, students, families, Hawaiian language immersion communities, and other organizations. Paepae o He‘eia plans to expand the educational and community outreach components of its program.

Section 11. Resource Restoration

Most NERRs in the system have habitats that are in less than pristine condition because of land uses and/or climate-related impacts. Resource restoration offers the opportunity for NERRs to support habitats in order to reestablish a self-sustaining habitat resembling a natural condition (Turner and Streever, 2002) and in doing so, inform the practice of restoration through hypothesis-driven restoration design. Restoration planning can take full advantage of the capability of NERR programs to prioritize and address climate and anthropogenic stressors. Within the national system, NERRs span the spectrum of restoration needs, from relatively intact systems with no readily apparent need for restoration, to those so altered that restoration may be the only way to achieve original ecosystem function. The level of detail and priorities needed in the restoration plan depend on where a NERR is along this continuum.

There are a number of resource restoration activities currently ongoing and proposed at the He‘eia NERR site. These include the restoration of native estuarine species following the removal of invasive mangroves, the restoration of the riparian area around He‘eia Stream, the removal of invasive algae on reefs in the bay, the establishment of a coral mitigation bank on two patch reefs in the bay, and the restoration of native forest in the uplands of the site. These restoration activities present an opportunity to monitor long-term changes in the ecosystem services provided by these areas as they are restored and to support the research goals and objectives of the He‘eia NERR. The resource restoration-related objectives and strategies identified in the He‘eia NERR Strategic Plan are listed below.

He‘eia NERR Restoration-Related Objectives and Strategies

Objective 1: Baseline environmental data informs researchers' understanding of the magnitude of changes in the various He‘eia ecosystems.	**Strategy 1(i):** Implement baseline biodiversity surveys with He‘eia NERR site partners.
	Strategy 1(j): Establish a site experimental design that supports ecosystem-based management research approach.
Objective 6: Integrate traditional knowledge and contemporary science to effectively address climate change, habitat restoration, and water quality.	**Strategy 6(a):** Utilize historical photos, testimonials, and other information to document the land use history of the ahupua‘a of He‘eia and incorporate into He‘eia NERR education and interpretative programs.

Objective 7: Engage and educate the community on the practices and values of the ahupuaʻa land management system; in other words, promote ʻāina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.	**Strategy 7(b):** Collaborate with partners to incorporate Heʻeia NERR science, traditional knowledge and information in the rehabilitation of historical, agricultural and aquacultural resources within the Heʻeia NERR.
Objective 10: Support contemporary restoration of key areas in the Heʻeia NERR to improve habitat and increase ecosystem services.	**Strategy 10(a):** Demonstrate restoration best practices in the land and estuarine stewardship of Heʻeia NERR natural resources that support climate change adaptation.
	Strategy 10(c): Heʻeia NERR uses a multi-disciplinary and multi- sector approach in the implementation of restoration initiatives.
	Strategy 10(d): Work with partners to develop and implement a hybrid ecosystem framework for upland reforestation.
	Strategy 10(e:) Provide technical and monitoring assistance to support the removal of mangrove habitat and replacement with native estuarine species.
	Strategy 10(f): Develop a restoration and monitoring plan in collaboration with partners to guide the restoration of the Heʻeia Stream and adjacent buffer.
	Strategy 10(g): Provide technical assistance and support for the removal of invasive species and the establishment native plant communities within the Heʻeia Stream buffer and stream channels.

	Strategy 10(h): Collaborate with partners on existing coral reef restoration and monitoring initiatives that are occuring within the marine boundaries of the He‘eia NERR.
	Strategy 10(i): Coordinate future restoration planning and monitoring activities within marine boundaries of the He‘eia NERR.

11.1 Current and Proposed Resource Restoration at He‘eia NERR

There are a number of current and proposed resource restoration activities within the He‘eia NERR. The role of the He‘eia NERR in the context of these activities is to increase our understanding of the changes in the ecosystem. Through the research and monitoring of ecosystem services provided by the areas being restored, the He‘eia NERR will help inform and adaptively manage these areas with partners in support of the vision and mission of the He‘eia NERR. Using an ecosystem-based management (EBM) research framework, targeted ecosystem services affected by either the restoration activities or the previously described research-based manipulation activities will be evaluated and assessed over time to improve the long-term management and sustainability of the He‘eia NERR and a broad spectrum of Hawaiian estuarine environments. Examples of the ecosystem services which the restoration activities are expected to impact include sustainable fishery stocks, soil and nutrient retention, species biodiversity and habitat enhancement, and flood protection.

Many of the habitats in He‘eia are degraded, and restoration is an appropriate and supported activity for these habitats within a NERR. For example, parts of the marine habitats in the He‘eia NERR have become overgrown with invasive algae, affected by disease, and suffer from the effects of erosion and siltation. These areas require restoration and ongoing active monitoring and management. Given the research framework described in Chapter 4, the He‘eia NERR plans to monitor and assess the resource restoration approaches in each habitat with specific control areas that have been left undisturbed and where no active management is taking place. These control areas, where no action is planned for the next five years under this management plan, directly support the He‘eia NERR’s efforts to monitor and assess ecosystem services provided under the different EBM approaches being implemented within the He‘eia NERR. An outcome of Strategy 1(j) as presented in the Strategic Plan in Section 3 and referenced in the table above in Section 11, is to identify treatment and control areas within each major ecosystem type for the He‘eia NERR.

This section outlines restoration efforts that are currently being implemented or proposed by site partners and contribute to the implementation of the Strategic Plan goals and objectives. As the He‘eia NERR programs are developed and implemented, He‘eia NERR staff and the RAB may adaptively manage the site

according to the results of monitoring and research efforts tied to these restoration activities and their associated ecosystem services. Accordingly, the He‘eia NERR may seek new resources to support these activities.

11.2 Specific Resource Restoration Activities at He‘eia NERR

The restoration activities currently being implemented or proposed are described below and identified in Figure 11.3. Efforts are guided by management and conservation plans developed by site partners, and include restoration of degraded wetland habitats, upland areas overrun by invasive species, and coral reef habitats affected by invasive algae and sedimentation. The restoration plans are informed by historical knowledge gathered from community partners about the area, and these efforts will continue and be supported by the activities of the He‘eia NERR.

11.2.1 Kāko‘o ‘Ōiwi—Estuarine Habitat Restoration

On the makai (seaward) part of the He‘eia CDD, an invasive mangrove forest has altered the He‘eia estuarine habitat and is choking the He‘eia Stream. The mangroves will be cut down and replaced with approximately 20 acres of native wetland sedges and open-water pools, which will serve as habitat for native birds and as a nursery for juvenile fish (Figure 11-3). To minimize potential impacts on the endangered Hawaiian hoary bat, removal of the mangrove trees will not be conducted during the bat’s breeding season, which extends from June 15 through September 15.

The re-establishment of native estuarine plants to replace the invasive mangroves may contribute to increased resilience of the estuary to climate change impacts through enhanced flood protection and shoreline stabilization. The restored estuary is also expected to enhance habitat for native aquatic species such as fish, algae and native sea turtles. Kāko‘o ‘Ōiwi is the main site partner for restoring the estuary within the He‘eia CDD, and the He‘eia NERR will coordinate with them to design and implement an effective monitoring strategy to understand and assess the effect of the restoration on the ecosystem services provided by the estuary. In addition to a monitoring strategy for the area, the He‘eia NERR will also provide technical assistance, help to establish baseline conditions, and offer planning functions to support these restoration activities being implemented by Kāko‘o ‘Ōiwi.

11.2.2 Kāko‘o ‘Ōiwi—Riparian Restoration

In the wetlands of He‘eia and in the He‘eia Stream channel (Figure 11-3), California grass and other invasive plants dramatically reduce water flow and adversely affect water quality (Figure 11-1). Water quality samples collected by HIMB in areas of the stream overgrown with California grass suggest that the oxygen content of the water is so low that it cannot support aquatic animals. Following a hydrologic and hydraulic study to better understand streamflow under various storm conditions, the stream channel and riparian area will be restored to improve water quality and flow and provide better habitat for native aquatic and bird species.

Kākoʻo ʻŌiwi plans to replace the current California grass and other invasive plants along the stream with native plants within an at least 100 ft. wide buffer along either side of the stream. Riparian area plants that may be introduced to replace the California grass include: Ahuʻawa Cyperus javanicus, ʻAkiʻaki (*Schoenoplecus spp*.), ʻAkulikuli (*Sesuvium portulacastrum*), Bacopa (*Bacopa monnieri*), Ihiʻihi (*Marsilea villosa*), Kaluha (*Bolboschoenus maritimus*), Makaloa (*Cyperus laevigatus*), Pycreus (*Pycreus polystchyos*), and ʻuki (*Cladium jamaicense*). The marsh habitat along the stream is known to occasionally provide feeding and loafing habitat for four endangered waterbirds: Hawaiian gallinule (*Gallinula chloropus sandvicensis*), Hawaiian duck or koloa (*Anas wyvilliana*), Hawaiian coot (*Fulica alai*), and the Hawaiian stilt (*Himantopus mexicanus knudseni*) and restoring the area with native plants is expected to enhance the habitat for these waterbirds.

The restoration of the stream channel and streambanks is expected to enhance habitat for native aquatic species such as fish, algae and native sea turtles, as well as help to stabilize the shoreline and retain soil and nutrients from eroding into the stream. This in turn may help to reduce harmful impacts to the fishpond and coral reefs downstream. Heʻeia NERR will coordinate with Kākoʻo ʻŌiwi to design and implement an effective monitoring strategy to gauge the effect of the stream restoration on the ecosystem services it provides. In addition to a monitoring strategy for the stream and associated buffer zone, the Heʻeia NERR will also provide technical assistance, help to establish baseline conditions, and planning functions to support these restoration activities being implemented by Kākoʻo ʻŌiwi.

Figure 11-1. Unrestored Heʻeia Stream invaded by California grass (*Urochloa mutica*)

(Photo courtesy of H.T. Harvey & Associates)

11.2.3 Kākoʻo ʻŌiwi—Upland Reforestation

The upland areas of the Heʻeia CDD are currently overgrown with nonnative invasive species. Some of the species currently found in the upland include java plum (*Syzygium cumini*), cat's claw (*Caesalpinia decapetala*), Cuba jute (*Sida rhombifolia*), koa haole (*Leucaena leucocephala*), and guava (*Psidium guajava*). Restoration of the upland areas will include the implementation of a hybrid ecosystem framework where there is a strong emphasis on enhancing the ecological characteristics of the area and improving ecosystem functionality. Using a hybrid ecosystem framework, restoration of the upland areas identified in Figure 11.1 will include removal of invasive non-native plant species, but allow for select non-native plants to remain, particularly those species that provide key forest structural attributes or important ecosystem services. Examples of these types of non-native plants include: Monkeypod tree (*Pithecellobium saman*), Gun Powder tree (*Trema orientalis*), Kukui (*Aleurites moluccanus*), Hau (*Hibiscus tiliceus*), Mango (*Mangifera indica*), and Kiawe (*Prosopis pallida*). Appropriate plant species will be determined upon a more thorough evaluation of existing vegetation, slope, and soil type. The Heʻeia NERR and its partners along with Kākoʻo ʻŌiwi will develop baseline assumptions around the reforestation and coordinate any anticipated human uses in the area and their interface with the Heʻeia NERR.

As the upland areas are to be restored with mainly native tree species, this may contribute to supporting a more resilient habitat for native and endemic fauna and flora. Given the potential for increased intensity and frequency of storms under climate change scenarios, a predominantly native forest is expected to capture rain and decrease the runoff that now occurs in the area that is overgrown with California grass and other invasive species. Kākoʻo ʻŌiwi is the main site partner for restoring the upland areas within the Heʻeia CDD, and the Heʻeia NERR will coordinate with them to design and implement an effective monitoring strategy to understand and assess the effects of the restoration on specific ecosystem services. In addition to developing a monitoring strategy for the upland forest, the Heʻeia NERR will also provide technical assistance, help to establish baseline conditions, and offer planning functions to support these restoration activities being implemented by Kākoʻo ʻŌiwi.

11.2.4 DAR—Coral Reef Restoration

Hawaiʻi DLNR's Division of Aquatic Resources (DAR) is implementing a program to control alien algae on coral reefs in Kāneʻohe Bay (DAR 2013). DAR uses a mechanical suction device called the "Super Sucker" (i.e., an underwater vacuum system) to remove invasive algae from Kāneʻohe Bay reefs (Figure 11-3). DAR then releases captive-reared sea urchins to graze on the remaining algae and thereby slow the regrowth of the infestation (Westbrook, et. al. 2015). Thousands of pounds of algae are removed from the bay including portions of the Heʻeia NERR and given to local farmers in the Kāneʻohe Bay area to be used as compost and fertilizer for their taro, sweet potato, corn, and flowering plant crops. The algae, high in nutrients, is used by farmers as a natural fertilizer to support healthy crop growth.

Both DAR and HIMB are potential partners for continuing this project in the bay. The reefs within the He'eia NERR that could have invasive algae removed from them are highlighted in Figure 11-3. In order to measure the effectiveness of algae removal on coral reef related ecosystem services and the success of sea urchin grazing to slow the growth of remaining algae, a monitoring strategy is needed. Working in coordination with DAR, HIMB, and other interested parties, the He'eia NERR will support the development and implementation of a coral reef monitoring strategy. In addition to the monitoring strategy for reef restoration, the He'eia NERR will also provide technical assistance, help to establish baseline conditions, and offer planning functions to support these restoration activities on the reefs. Resilience of the reefs to invasive algae is an important component of Kāne'ohe Bay's general health, and may help to inform climate change research regarding the spread of invasive species as conditions change in Kāne'ohe Bay and in other areas across the Hawaiian Islands.

Figure 11-2. Use of the "Super Sucker" removes invasive algae and helps restore coral reefs

(Photo courtesy of DAR)

11.2.5 DAR—Kāne'ohe Bay Patch Reef Coral Mitigation Bank

Hawai'i DLNR's Division of Aquatic Resources (DAR) is proposing to establish a coral reef mitigation bank on several patch reefs in Kāne'ohe Bay, including Patch Reef #10 and also using Patch Reef #9 within the proposed He'eia NERR boundary, as a control reference area (Figure 11-3) (USACE 2014). The coral mitigation bank will restore degraded patch reefs where invasive algae has taken over and caused partial or full mortality of live corals. As such, this activity would qualify as a NERR restoration activity within the He'eia NERR. As described above, the planned restoration activities at Patch Reef #10 will involve removal of the invasive algae by means of the Super Sucker and the release of sea urchins on the reefs to graze on residual invasive algae and prevent its regrowth. Patch Reef #9 will be used as a control reference site where no management or restoration action will occur and be used to evaluate the success of the restoration activities on Patch Reef #10. Sites besides Patch Reef #10 in Kāne'ohe Bay and the He'eia

NERR may be included in the mitigation bank, but first the mitigation bank proposal will need to be evaluated, and the site-specific plan publicly reviewed. The proposed treatment of bank sites is expected to result in significant restoration and benefit to the affected coral reefs.

Kāneʻohe Bay and portions of the Heʻeia NERR are ecologically suitable restoration sites because there is an identifiable threat of invasive algae to coral reefs, as well as established methods for restoring these areas. Removing invasive algae allows corals to regrow where partial mortality has occurred, and to recolonize previously occupied habitats. Although coral colonization may take several years, other native macroalgae or crustose coralline algae (a precursor to coral growth) may colonize these areas in the interim.

The resilience of the reefs to invasive algae is an important component of Kāneʻohe Bay's general health, and may help to inform climate change research regarding the spread of invasive species as conditions change in the bay and in other areas across the Hawaiian Islands. The Heʻeia NERR will support the efforts of DAR by coordinating with them and other partners to develop a monitoring strategy, providing technical assistance, helping to establish baseline conditions, and offering planning functions.

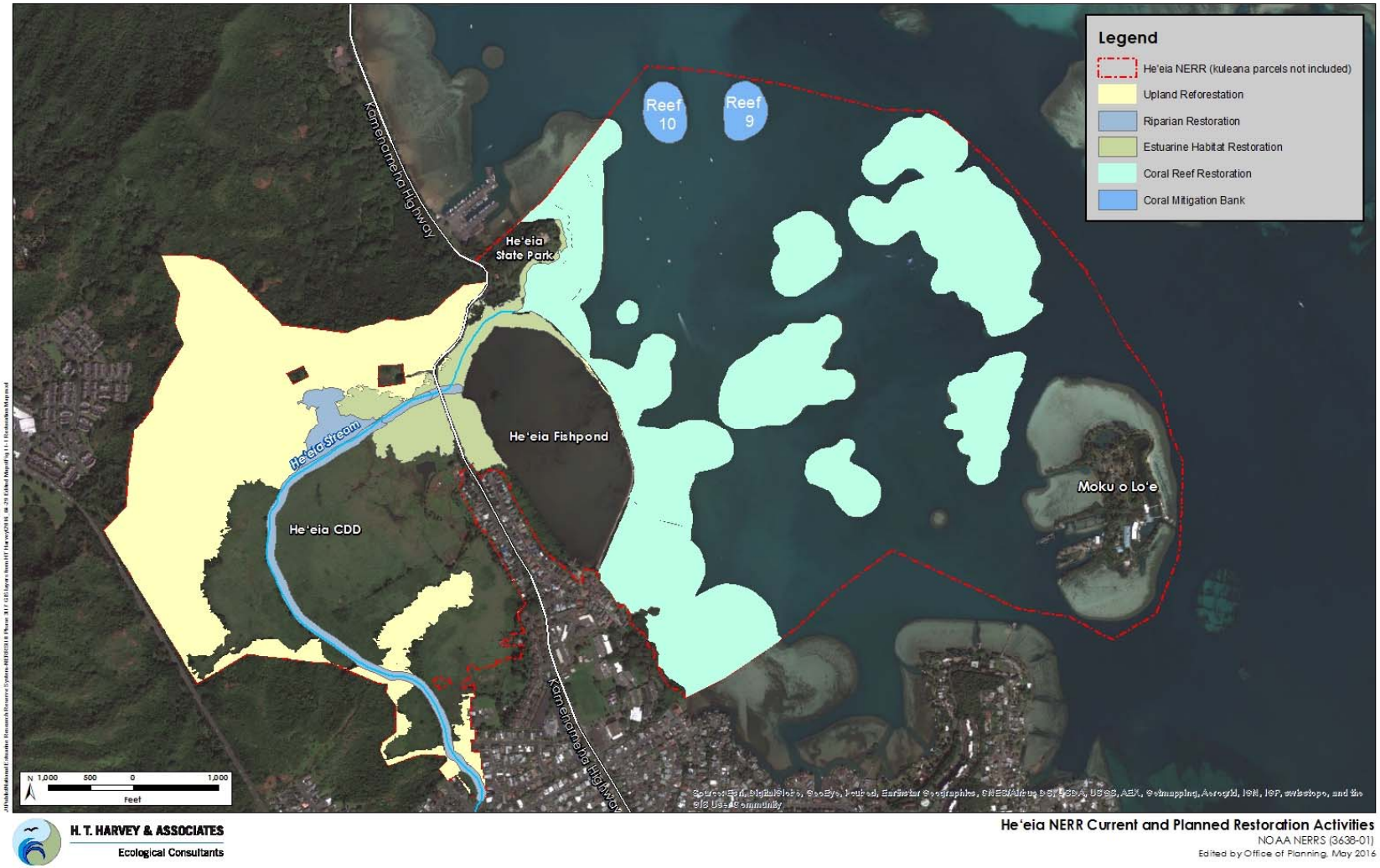

Figure 11-3. Kākoʻo ʻŌiwi and DLNR-DAR's current and planned restoration projects

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Appendix A. NERRS Regulations

SUBCHAPTER B—OCEAN AND COASTAL RESOURCE MANAGEMENT

PART 921—NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM REGULATIONS

Subpart A—General

Subpart B—Site Selection, Post Site Selection and Management Plan Development

Subpart C—Acquisition, Development and Preparation of the Final Management Plan

Subpart D—Reserve Designation and Subsequent Operation

Subpart E—Ongoing Oversight, Performance Evaluation and Withdrawal of Designation

Subpart F—Special Research Projects

Subpart G—Special Monitoring Projects

Subpart H—Special Interpretation and Education Projects

Subpart I—General Financial Assistance Provisions

AUTHORITY: Section 315 of the Coastal Zone Management Act, as amended (16 U.S.C. 1461).

SOURCE: 58 FR 38215, July 15, 1993, unless otherwise noted.

Subpart A—General

§921.1 Mission, goals and general provisions.

(a) The mission of the National Estuarine Research Reserve Program is the establishment and management, through Federal-state cooperation, of a national system (National Estuarine Research Reserve System or System) of estuarine research reserves (National Estuarine Research Reserves or Reserves) representative of the various regions and estuarine types in the United States. National Estuarine Research Reserves are established to provide opportunities for long-term research, education, and interpretation.

(b) The goals of the Program are to:

(1) Ensure a stable environment for research through long-term protection of National Estuarine Research Reserve resources;

(2) Address coastal management issues identified as significant through coordinated estuarine research within the System;

(3) Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;

(4) Promote Federal, state, public and private use of one or more Reserves within the System when such entities conduct estuarine research; and

(5) Conduct and coordinate estuarine research within the System, gathering and making available information necessary for improved understanding and management of estuarine areas.

(c) National Estuarine Research Reserves shall be open to the public to the extent permitted under state and Federal law. Multiple uses are allowed to the degree compatible with each Reserve's overall purpose as provided in the management plan (see §921.13) and consistent with paragraphs (a) and (b) of this section. Use levels are set by the state where the Reserve is located and analyzed in the management plan. The Reserve management plan shall describe the uses and establish priorities among these uses. The plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. Consistent with resource protection and research objectives, public access and use may be restricted to certain areas or components within a Reserve.

(d) Habitat manipulation for research purposes is allowed consistent with the following limitations. Manipulative research activities must be specified in the management plan, be consistent with the mission and goals of the program (see paragraphs (a) and (b) of this section) and the goals and objectives set forth in the Reserve's management plan, and be limited in nature and extent to the minimum manipulative activity necessary to accomplish the stated research objective. Manipulative research activities with a significant or long-term impact on Reserve resources require the prior approval of the state and the National Oceanic and Atmospheric Administration (NOAA). Manipulative research activities which can reasonably be expected to have a significant adverse impact on the estuarine resources and habitat of a Reserve, such that the activities themselves or their resulting short- and long-term consequences compromise the representative character and integrity of a Reserve, are prohibited. Habitat manipulation for resource management purposes is prohibited except as specifically approved by NOAA as: (1) A restoration activity consistent with paragraph (e) of this section; or (2) an activity necessary for the protection of public health or the preservation of other sensitive resources which have been listed or are eligible for protection under relevant Federal or state authority (e.g., threatened/endangered species or significant historical or cultural resources) or if the manipulative activity is a long-term pre-existing use (i.e., has occurred prior to designation) occurring in a buffer area. If habitat manipulation is determined to be necessary for the protection of public health, the preservation of sensitive resources, or if the manipulation is a long-term pre-existing use in a buffer area, then these activities shall be specified in the Reserve management plan in accordance with §921.13(a)(10) and shall be limited to the reasonable alternative which has the least adverse and shortest term impact on the representative and ecological integrity of the Reserve.

(e) Under the Act an area may be designated as an estuarine Reserve only if the area is a representative estuarine ecosystem that is suitable for long-term research. Many estuarine areas have undergone some ecological change as a result of human activities (e.g., hydrological changes, intentional/unintentional species composition changes—introduced and exotic species). In those areas proposed or designated as National Estuarine Research Reserves, such changes may have diminished the representative character and integrity of the site. Although restoration of degraded areas is not a primary purpose of the System, such activities may be permitted to improve the representative character and integrity of a Reserve. Restoration activities must be carefully planned and approved by NOAA through the Reserve management plan. Historical research may be necessary to determine the ''natural'' representative state of an estuarine area (i.e., an estuarine ecosystem minimally affected by

human activity or influence). Frequently, restoration of a degraded estuarine area will provide an excellent opportunity for management oriented research.

(f) NOAA may provide financial assistance to coastal states, not to exceed, per Reserve, 50 percent of all actual costs or $5 million whichever amount is less, to assist in the acquisition of land and waters, or interests therein. NOAA may provide financial assistance to coastal states not to exceed 70 percent of all actual costs for the management and operation of, the development and construction of facilities, and the conduct of educational or interpretive activities concerning Reserves (see subpart I). NOAA may provide financial assistance to any coastal state or public or private person, not to exceed 70 percent of all actual costs, to support research and monitoring within a Reserve. Notwithstanding any financial assistance limits established by this Part, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available. Predesignation, acquisition and development, operation and management, special research and monitoring, and special education and interpretation awards are available under the National Estuarine Reserve Program. Predesignation awards are for site selection/feasibility, draft management plan preparation and conduct of basic characterization studies. Acquisition and development awards are intended primarily for acquisition of interests in land, facility construction and to develop and/or upgrade research, monitoring and education programs. Operation and management awards provide funds to assist in implementing, operating and managing the administrative, and basic research, monitoring and education programs, outlined in the Reserve management plan. Special research and monitoring awards provide funds to conduct estuarine research and monitoring projects with the System. Special educational and interpretive awards provide funds to conduct estuarine educational and interpretive projects within the System.

(g) Lands already in protected status managed by other Federal agencies, state or local governments, or private organizations may be included within National Estuarine Research Reserves only if the managing entity commits to long-term management consistent with paragraphs (d) and (e) of this section in the Reserve management plan. Federal lands already in protected status may not comprise a majority of the key land and water areas of a Reserve (see §921.11(c)(3)).

(h) To assist the states in carrying out the Program's goals in an effective manner, NOAA will coordinate a research and education information exchange throughout the National Estuarine Research Reserve System. As part of this role, NOAA will ensure that information and ideas from one Reserve are made available to others in the System. The network will enable Reserves to exchange information and research data with each other, with universities engaged in estuarine research, and with Federal, state, and local agencies. NOAA's objective is a system-wide program of research and monitoring capable of addressing the management issues that affect long-term productivity of our Nation's estuaries.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§921.2 Definitions.

(a) Act means the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 et seq.

(b) Assistant Administrator means the Assistant Administrator for Ocean Services and Coastal Zone Management or delegee.

(c) Coastal state means a state of the United States, in or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes. For the purposes of these regulations the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Marianas Islands, the Trust Territories of the Pacific Islands, and American Samoa (see 16 U.S.C. 1453(4)).

(d) State agency means an instrumentality of a coastal state to whom the coastal state has delegated the authority and responsibility for the creation and/or management/operation of a National Estuarine Research Reserve. Factors indicative of this authority may include the power to receive and expend funds on behalf of the Reserve, acquire and sell or convey real and personal property interests, adopt rules for the protection of the Reserve, enforce rules applicable to the Reserve, or develop and implement research and education programs for the reserve. For the purposes of these regulations, the terms ''coastal state'' and ''State agency'' shall be synonymous.

(e) Estuary means that part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes estuary-type areas with measurable freshwater influence and having unimpaired connections with the open sea, and estuary-type areas of the Great Lakes and their connecting waters (see 16 U.S.C. 1453(7)).

(f) National Estuarine Research Reserve means an area that is a representative estuarine ecosystem suitable for long-term research, which may include all of the key land and water portion of an estuary, and adjacent transitional areas and uplands constituting to the extent feasible a natural unit, and which is set aside as a natural field laboratory to provide long-term opportunities for research, education, and interpretation on the ecological relationships within the area (see 16 U.S.C. 1453(8)) and meets the requirements of 16 U.S.C. 1461(b). This includes those areas designated as National Estuarine Sanctuaries or Reserves under section 315 of the Act prior to enactment of the Coastal Zone Act Reauthorization Amendments of 1990 and each area subsequently designated as a National Estuarine Research Reserve.

§ 921.3 National Estuarine Research Reserve System biogeographic classification scheme and estuarine typologies.

(a) National Estuarine Research Reserves are chosen to reflect regional differences and to include a variety of ecosystem types. A biogeographic classification scheme based on regional variations in the nation's coastal zone has been developed. The biogeographic classification scheme is used to ensure that the National Estuarine Research Reserve System includes at least one site from each region. The estuarine typology system is utilized to ensure that sites in the System reflect the wide range of estuarine types within the United States.

(b) The biogeographic classification scheme, presented in appendix I, contains 29 regions. Figure 1 graphically depicts the biogeographic regions of the United States.

(c) The typology system is presented in appendix II.

§ 921.4 Relationship to other provisions of the Coastal Zone Management Act, and to the Marine Protection, Research and Sanctuaries Act.

(a) The National Estuarine Research Reserve System is intended to provide information to state agencies and other entities involved in addressing coastal management issues. Any coastal state, including those that do not have approved coastal management programs under section 306 of the Act, is eligible for an award under the National Estuarine Research Reserve Program (see §921.2(c)).

(b) For purposes of consistency review by states with a federally approved coastal management program, the designation of a National Estuarine Research Reserve is deemed to be a Federal activity, which, if directly affecting the state's coastal zone, must be undertaken in a manner consistent to the maximum extent practicable with the approved state coastal management program as provided by section 1456(c)(1) of the Act, and implementing regulations at 15 CFR part 930, subpart C. In accordance with section 1456(c)(1) of the Act and the applicable regulations NOAA will be responsible for certifying that designation of the Reserve is consistent with the state's approved coastal management program. The state must concur with or object to the certification. It is recommended that the lead state agency for Reserve designation consult, at the

earliest practicable time, with the appropriate state officials concerning the consistency of a proposed National Estuarine Research Reserve.

(c) The National Estuarine Research Reserve Program will be administered in close coordination with the National Marine Sanctuary Program (Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 U.S.C. 1431–1445), also administered by NOAA. Title III authorizes the Secretary of Commerce to designate discrete areas of the marine environment as National Marine Sanctuaries to protect or restore such areas for their conservation, recreational, ecological, historical, research, educational or esthetic values. National Marine Sanctuaries and Estuarine Research Reserves may not overlap, but may be adjacent.

Subpart B—Site Selection, Post Site Selection and Management Plan Development

§921.10 General.

(a) A coastal state may apply for Federal financial assistance for the purpose of site selection, preparation of documents specified in §921.13 (draft management plan (DMP) and environmental impact statement (EIS)), and the conduct of limited basic characterization studies. The total Federal share of this assistance may not exceed $100,000. Federal financial assistance for preacquisition activities under §921.11 and §921.12 is subject to the total $5 million for which each Reserve is eligible for land acquisition. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more coastal states, each state is eligible for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Each separate National Estuarine Research Reserve is eligible for the full complement of funding. Financial assistance application procedures are specified in subpart I.

(b) In developing a Reserve program, a state may choose to develop a multiple-site Reserve reflecting a diversity of habitats in a single biogeographic region. A multiple-site Reserve allows the state to develop complementary research and educational programs within the individual components of its multi-site Reserve. Multiple-site Reserves are treated as one Reserve in terms of financial assistance and development of an overall management framework and plan. Each individual site of a proposed multiple-site Reserve shall be evaluated both separately under §921.11(c) and collectively as part of the site selection process. A coastal state may propose to establish a multiple-site Reserve at the time of the initial site selection, or at any point in the development or operation of the Reserve. If the state decides to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award is made for a single site, the proposal is subject to the requirements set forth in §921.33(b). However, a state may not propose to add one or more sites to an already designated Reserve if the operation and management of such Reserve has been found deficient and uncorrected or the research conducted is not consistent with the Estuarine Research Guidelines referenced in §921.51. In addition, Federal funds for the acquisition of a multiple-site Reserve remain limited to $5,000,000 (see §921.20). The funding for operation of a multiple-site Reserve is limited to the maximum allowed for any one Reserve per year (see §921.32(c)) and preacquisition funds are limited to $100,000 per Reserve. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 63 FR 26717, May 14, 1998]

§ 921.11 Site selection and feasibility.

(a) A coastal state may use Federal funds to establish and implement a site selection process which is approved by NOAA.

(b) In addition to the requirements set forth in subpart I, a request for Federal funds for site selection must contain the following programmatic information:

(1) A description of the proposed site selection process and how it will be implemented in conformance with the biogeographic classification scheme and typology (§921.3);

(2) An identification of the site selection agency and the potential management agency; and

(3) A description of how public participation will be incorporated into the process (see §921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

(1) The site's contribution to the biogeographical and typological balance of the National Estuarine Research Reserve System. NOAA will give priority consideration to proposals to establish Reserves in biogeographic regions or subregions or incorporating types that are not represented in the system. (see the biogeographic classification scheme and typology set forth in §921.3 and appendices I and II);

(2) The site's ecological characteristics, including its biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests. The proposed site must be a representative estuarine ecosystem and should, to the maximum extent possible, be an estuarine ecosystem minimally affected by human activity or influence (see §921.1(e)).

(3) Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. Reserve boundaries must encompass the area within which adequate control has or will be established by the managing entity over human activities occurring within the Reserve. Generally, Reserve boundaries will encompass two areas: Key land and water areas (or ''core area'') and a buffer zone. Key land and water areas and a buffer zone will likely require significantly different levels of control (see §921.13(a)(7)). The term ''key land and water areas'' refers to that core area within the Reserve that is so vital to the functioning of the estuarine ecosystem that it must be under a level of control sufficient to ensure the long-term viability of the Reserve for research on natural processes. Key land and water areas, which comprise the core area, are those ecological units of a natural estuarine system which preserve, for research purposes, a full range of significant physical, chemical and biological factors contributing to the diversity of fauna, flora and natural processes occurring within the estuary. The determination of which land and water areas are ''key'' to a particular Reserve must be based on specific scientific knowledge of the area. A basic principle to follow when deciding upon key land and water areas is that they should encompass resources representative of the total ecosystem, and which if compromised could endanger the research objectives of the Reserve. The term buffer zone refers to an area adjacent to or surrounding key land and water areas and essential to their integrity. Buffer zones protect the core area and provide additional protection for estuarine-dependent species, including those that are rare or endangered. When determined appropriate by the state and approved by NOAA, the buffer zone may also include an area necessary for facilities required for research and interpretation. Additionally, buffer zones should be established sufficient to accommodate a shift of the core area as a result of biological, ecological or geomorphological change which reasonably could be expected to occur. National Estuarine Research Reserves may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced. However, NOAA will not approve a site

for potential National Estuarine Research Reserve status that is dependent primarily upon the inclusion of currently protected Federal lands in order to meet the requirements for Reserve status (such as key land and water areas). Such lands generally will be included within a Reserve to serve as a buffer or for other ancillary purposes; and may be included, subject to NOAA approval, as a limited portion of the core area;

(4) The site's suitability for long-term estuarine research, including ecological factors and proximity to existing research facilities and educational institutions;

(5) The site's compatibility with existing and potential land and water uses in contiguous areas as well as approved coastal and estuarine management plans; and

(6) The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process the state must seek the views of affected landowners, local governments, other state and Federal agencies and other parties who are interested in the area(s) being considered for selection as a potential National Estuarine Research Reserve. After the local government(s) and affected landowner(s) have been contacted, at least one public meeting shall be held in the vicinity of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal newspaper at least 15 days prior to the date of the meeting and by NOAA in the FEDERAL REGISTER.

(e) A state request for NOAA approval of a proposed site (or sites in the case of a multi-site Reserve) must contain a description of the proposed site(s) in relationship to each of the site selection principals (§921.11(c)) and the following information:

(1) An analysis of the proposed site(s) based on the biogeographical scheme/typology discussed in §921.3 and set forth in appendices I and II;

(2) A description of the proposed site(s) and its (their) major resources, including location, proposed boundaries, and adjacent land uses. Maps are required;

(3) A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted. Copies of all correspondence, including contact letters to all affected landowners must be appended;

(4) A list of all sites considered and a brief statement of the reasons why a site was not preferred; and

(5) A nomination of the proposed site(s) for designation as a National Estuarine Research Reserve by the Governor of the coastal state in which the state is located.

(f) A state proposing to reactivate an inactive site, previously approved by NOAA for development as an Estuarine Sanctuary or Reserve, may apply for those funds remaining, if any, provided for site selection and feasibility (§921.11a)) to determine the feasibility of reactivation. This feasibility study must comply with the requirements set forth in §921.11 (c) through (e).

§921.12 Post site selection.

(a) At the time of the coastal state's request for NOAA approval of a proposed site, the state may submit a request for funds to develop the draft management plan and for preparation of the EIS. At this time, the state may also submit a request for the remainder of the predesignation funds to perform a limited basic characterization of the physical, chemical and biological characteristics of the site approved by NOAA necessary for providing EIS information to NOAA. The state's request for these post site selection funds must be accompanied by the information specified in subpart I and, for draft management plan development and EIS information collection, the following programmatic information:

(1) A draft management plan outline (see §921.13(a) below); and

(2) An outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state role in Reserve management during the initial period of Federal funding and expressing the

state's long-term commitment to operate and manage the Reserve.

(b) The state is eligible to use the funds referenced in §921.12(a) after the proposed site is approved by NOAA under the terms of §921.11.

§921.13 Management plan and environmental impact statement development.

(a) After NOAA approves the state's proposed site and application for funds submitted pursuant to §921.12, the state may begin draft management plan development and the collection of information necessary for the preparation by NOAA of an EIS. The state shall develop a draft management plan, including an MOU. The plan shall set out in detail:

(1) Reserve goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;

(2) An administrative plan including staff roles in administration, research, education/interpretation, and surveillance and enforcement;

(3) A research plan, including a monitoring design;

(4) An education/interpretive plan;

(5) A plan for public access to the Reserve;

(6) A construction plan, including a proposed construction schedule, general descriptions of proposed developments and general cost estimates. Information should be provided for proposed minor construction projects in sufficient detail to allow these projects to begin in the initial phase of acquisition and development. A categorical exclusion, environmental assessment, or EIS may be required prior to construction;

(7)(i) An acquisition plan identifying the ecologically key land and water areas of the Reserve, ranking these areas according to their relative importance, and including a strategy for establishing adequate long-term state control over these areas sufficient to provide protection for Reserve resources to ensure a stable environment for research. This plan must include an identification of ownership within the proposed Reserve boundaries, including land already in the public domain; the method(s) of acquisition which the state proposes to use—acquisition (including less-than-fee simple options) to establish adequate long-term state control; an estimate of the fair market value of any property interest—which is proposed for acquisition; a schedule estimating the time required to complete the process of establishing adequate state control of the proposed research reserve; and a discussion of any anticipated problems. In selecting a preferred method(s) for establishing adequate state control over areas within the proposed boundaries of the Reserve, the state shall perform the following steps for each parcel determined to be part of the key land and water areas (control over which is necessary to protect the integrity of the Reserve for research purposes), and for those parcels required for research and interpretive support facilities or buffer purposes:

(A) Determine, with appropriate justification, the minimum level of control(s) required [e.g., management agreement, regulation, less-than-fee simple property interest (e.g., conservation easement), fee simple property acquisition, or a combination of these approaches]. This does not preclude the future necessity of increasing the level of state control;

(B) Identify the level of existing state control(s);

(C) Identify the level of additional state control(s), if any, necessary to meet the minimum requirements identified in paragraph (a)(7)(i)(A) of this section;

(D) Examine all reasonable alternatives for attaining the level of control identified in paragraph (a)(7)(i)(C) of this section, and perform a cost analysis of each; and

(E) Rank, in order of cost, the methods (including acquisition) identified in paragraph (a)(7)(i)(D) of this section.

(ii) An assessment of the relative cost-effectiveness of control alternatives shall include a reasonable estimate of both short-term costs (e.g., acquisition of property interests, regulatory program development including associated enforcement costs, negotiation, adjudication, etc.) and long-term costs (e.g., monitoring, enforcement,

adjudication, management and coordination). In selecting a preferred method(s) for establishing adequate state control over each parcel examined under the process described above, the state shall give priority consideration to the least costly method(s) of attaining the minimum level of long-term control required. Generally, with the possible exception of buffer areas required for support facilities, the level of control(s) required for buffer areas will be considerably less than that required for key land and water areas. This acquisition plan, after receiving the approval of NOAA, shall serve as a guide for negotiations with landowners. A final boundary for the reserve shall be delineated as a part of the final management plan;

(8) A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the research reserve, and a strategy for research reserve surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;

(9) If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions;

(10) If applicable, a resource manipulation plan, describing those portions of the Reserve buffer in which long-term pre-existing (prior to designation) manipulation for reasons not related to research or restoration is occurring. The plan shall explain in detail the nature of such activities, shall justify why such manipulation should be permitted to continue within the reserve buffer; and shall describe possible effects of this manipulation on key land and water areas and their resources;

(11) A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the National Estuarine Research Reserve, and expressing a long-term commitment by the state to maintain and manage the Reserve in accordance with section 315 of the Act, 16 U.S.C. 1461, and applicable regulations. In conjunction with the MOU, and where possible under state law, the state will consider taking appropriate administrative or legislative action to ensure the long-term protection and operation of the National Estuarine Research Reserve. If other MOUs are necessary (such as with a Federal agency, another state agency or private organization), drafts of such MOUs must be included in the plan. All necessary MOU's shall be signed prior to Reserve designation; and

(12) If the state has a federally approved coastal management program, a certification that the National Estuarine Research Reserve is consistent to the maximum extent practicable with that program. See §§921.4(b) and 921.30(b).

(b) Regarding the preparation of an EIS under the National Environmental Policy Act on a National Estuarine Research Reserve proposal, the state and NOAA shall collect all necessary information concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, the state will draft and provide NOAA with a preliminary EIS.

(c) Early in the development of the draft management plan and the draft EIS, the state and NOAA shall hold a scoping meeting (pursuant to NEPA) in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the FEDERAL REGISTER at least 15 days prior to the meeting. The state shall be responsible for publishing a similar notice in the local media.

(d) NOAA will publish a FEDERAL REGISTER notice of intent to prepare a draft EIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the draft EIS will appear in the FEDERAL REGISTER. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed national estuarine research reserve. The hearing will be held no sooner than 15 days after appropriate notice of the meeting has been given in the principal news media by the state and in the FEDERAL REGISTER by NOAA. After a 45-day

comment period, a final EIS will be prepared by the state and NOAA.

Subpart C—Acquisition, Development and Preparation of the Final Management Plan

§ 921.20 General.

The acquisition and development period is separated into two major phases. After NOAA approval of the site, draft management plan and draft MOU, and completion of the final EIS, a coastal state is eligible for an initial acquisition and development award(s). In this initial phase, the state should work to meet the criteria required for formal research reserve designation; e.g., establishing adequate state control over the key land and water areas as specified in the draft management plan and preparing the final management plan. These requirements are specified in § 921.30. Minor construction in accordance with the draft management plan may also be conducted during this initial phase. The initial acquisition and development phase is expected to last no longer than three years. If necessary, a longer time period may be negotiated between the state and NOAA. After Reserve designation, a state is eligible for a supplemental acquisition and development award(s) in accordance with § 921.31. In this post-designation acquisition and development phase, funds may be used in accordance with the final management plan to construct research and educational facilities, complete any remaining land acquisition, for program development, and for restorative activities identified in the final management plan. In any case, the amount of Federal financial assistance provided to a coastal state with respect to the acquisition of lands and waters, or interests therein, for any one National Estuarine Research Reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein or $5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§ 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient prior to designation in:

(1) Acquiring a fee simple or less-than-fee simple real property interest in land and water areas to be included in the Reserve boundaries (see § 921.13(a)(7); § 921.30(d));

(2) Minor construction, as provided in paragraphs (b) and (c) of this section;

(3) Preparing the final management plan; and

(4) Initial management costs, e.g., for implementing the NOAA approved draft management plan, hiring a Reserve manager and other staff as necessary and for other management-related activities. Application procedures are specified in subpart I.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction, or for proposed restorative activities, is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted during the initial acquisition and development phase. No more than five (5) percent of the initial acquisition and development award may be expended on such activities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

(d) Except as specifically provided in paragraphs (a) through (c) of this section, construction projects, to be funded in whole or in part under an acquisition and development award(s), may not be initiated until the Reserve receives formal designation (see §921.30). This requirement has been adopted to ensure that substantial progress in establishing adequate state control over key land and water areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in establishing adequate state control/acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) For any real property acquired in whole or part with Federal funds for the Reserve, the state shall execute suitable title documents to include substantially the following provisions, or otherwise append the following provisions in a manner acceptable under applicable state law to the official land record(s):

(1) Title to the property conveyed by this deed shall vest in the [recipient of the award granted pursuant to section 315 of the Act, 16 U.S.C. 1461 or other NOAA approved state agency] subject to the condition that the designation of the [name of National Estuarine Reserve] is not withdrawn and the property remains part of the federally designated [name of National Estuarine Research Reserve]; and

(2) In the event that the property is no longer included as part of the Reserve, or if the designation of the Reserve of which it is part is withdrawn, then NOAA or its successor agency, after full and reasonable consultation with the State, may exercise the following rights regarding the disposition of the property:

(i) The recipient may retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property;

(ii) If the recipient does not elect to retain title, the Federal Government may either direct the recipient to sell the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (after deducting actual and reasonable selling and repair or renovation expenses, if any, from the sale proceeds), or direct the recipient to transfer title to the Federal Government. If directed to transfer title to the Federal Government, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the original project to the current fair market value of the property; and

(iii) Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by Department of Commerce regulations at 15 CFR part 24, and Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally assisted programs at 15 CFR part 11.

(f) Upon instruction by NOAA, provisions analogous to those of §921.21(e) shall be included in the documentation underlying less-then-fee-simple interests acquired in whole or part with Federal funds.

(g) Federal funds or non-Federal matching share funds shall not be spent to acquire a real property interest in which the state will own the land concurrently with another entity unless the property interest has been identified as a part of an acquisition strategy pursuant to §921.13(7) which has been approved by NOAA prior to the effective date of these regulations.

(h) Prior to submitting the final management plan to NOAA for review and approval, the state shall hold a public meeting to receive comment on the plan in the area affected by the estuarine research reserve. NOAA will publish a notice of the meeting in the FEDERAL REGISTER at least 15 days prior to the public meeting. The state shall be responsible for having a similar notice published in the local newspaper(s).

Subpart D—Reserve Designation and Subsequent Operation

§ 921.30 Designation of National Estuarine Research Reserves.

(a) The Under Secretary may designate an area proposed for designation by the Governor of the state in which it is located, as a National Esturaine Research Reserve if the Under Secretary finds:

(1) The area is a representative estuarine ecosystem that is suitable for long-term research and contributes to the biogeographical and typological balance of the System;

(2) Key land and water areas of the proposed Reserve, as identified in the management plan, are under adequate state control sufficient to provide long-term protection for reserve resources to ensure a stable environment for research;

(3) Designation of the area as a Reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation;

(4) A final management plan has been approved by NOAA;

(5) An MOU has been signed between the state and NOAA ensuring a long-term commitment by the state to the effective operation and implementation of the area as a National Estuarine Research Reserve;

(6) All MOU's necessary for reserve management (i.e., with relevant Federal, state, and local agencies and/or private organizations) have been signed; and

(7) The coastal state in which the area is located has complied with the requirements of subpart B.

(b) NOAA will determine whether the designation of a National Estuarine Research Reserve in a state with a federally approved coastal zone management program directly affects the coastal zone. If the designation is found to directly affect the coastal zone, NOAA will make a consistency determination pursuant to §307(c)(1) of the Act, 16 U.S.C. 1456, and 15 CFR part 930, subpart C. See §921.4(b). The results of this consistency determination will be published in the FEDERAL REGISTER when the notice of designation is published. See §921.30(c).

(c) NOAA will publish the notice of designation of a National Estuarine Research Reserve in the FEDERAL REGISTER. The state shall be responsible for having a similar notice published in the local media.

(d) The term state control in §921.30(a)(3) does not necessarily require that key land and water areas be owned by the state in fee simple. Acquisition of less-than-fee simple interests e.g., conservation easements) and utilization of existing state regulatory measures are encouraged where the state can demonstrate that these interests and measures assure adequate long-term state control consistent with the purposes of the research reserve (see also §§921.13(a)(7); 921.21(g)). Should the state later elect to purchase an interest in such lands using NOAA funds, adequate justification as to the need for such acquisition must be provided to NOAA.

§ 921.31 Supplemental acquisition and development awards.

After National Estuarine Research Reserve designation, and as specified in the approved management plan, a coastal state may request a supplemental acquisition and/or development award(s) for acquiring additional property interests identified in the management plan as necessary to strengthen protection of key land and water areas and to enhance long-term protection of the area for research and education, for facility and exhibit construction, for restorative activities identified in the approved management plan, for administrative purposes related to acquisition and/or facility construction and to develop and/or upgrade research, monitoring and education/interpretive programs. Federal financial assistance provided to a National Estuarine Research Reserve for supplemental development costs directly associated with facility construction (i.e., major construction activities) may not exceed 70 percent of the total project cost, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100

percent of the costs. NOAA must make a specific determination that the construction activity will not be detrimental to the environment. Acquisition awards for the acquisition of lands or waters, or interests therein, for any one reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein of $5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more states, each state is eligible independently for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Application procedures are specified in subpart I. Land acquisition must follow the procedures specified in §§921.13(a)(7), 921.21(e) and (f) and 921.81.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§921.32 Operation and management: Implementation of the management plan.

(a) After the Reserve is formally designated, a coastal state is eligible to receive Federal funds to assist the state in the operation and management of the Reserve including the management of research, monitoring, education, and interpretive programs. The purpose of this Federally funded operation and management phase is to implement the approved final management plan and to take the necessary steps to ensure the continued effective operation of the Reserve.

(b) State operation and management of the Reserves shall be consistent with the mission, and shall further the goals of the National Estuarine Research Reserve program (see §921.1).

(c) Federal funds are available for the operation and management of the Reserve. Federal funds provided pursuant to this section may not exceed 70 percent of the total cost of operating and managing the Reserve for any one year, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs. In the case of a biogeographic region (see Appendix I) shared by two or more states, each state is eligible for Federal financial assistance to establish a separate Reserve within their respective portion of the shared biogeographic region (see §921.10).

(d) Operation and management funds are subject to the following limitations:

(1) Eligible coastal state agencies may apply for up to the maximum share available per Reserve for that fiscal year. Share amounts will be announced annually by letter from the Sanctuary and Reserves Division to all participating states. This letter will be provided as soon as practicable following approval of the Federal budget for that fiscal year.

(2) No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

§921.33 Boundary changes, amendments to the management plan, and addition of multiple-site components.

(a) Changes in the boundary of a Reserve and major changes to the final management plan, including state laws or regulations promulgated specifically for the Reserve, may be made only after written approval by NOAA. NOAA may require public notice, including notice in the FEDERAL REGISTER and an opportunity for public comment before approving a boundary or management plan change. Changes in the boundary of a Reserve involving the acquisition of properties not listed in the management plan or final EIS require public notice and the opportunity for comment; in certain cases, a categorical exclusion, an environmental assessment and possibly an environmental impact statement may be required.

NOAA will place a notice in the FEDERAL REGISTER of any proposed changes in Reserve boundaries or proposed major changes to the final management plan. The state shall be responsible for publishing an equivalent notice in the local media. See also requirements of §§921.4(b) and 921.13(a)(11).

(b) As discussed in §921.10(b), a state may choose to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award for a single site has been made. NOAA will publish notice of the proposed new site including an invitation for comments from the public in the FEDERAL REGISTER. The state shall be responsible for publishing an equivalent notice in the local newspaper(s). An EIS, if required, shall be prepared in accordance with section §921.13 and shall include an administrative framework for the multiple-site Reserve and a description of the complementary research and educational programs within the Reserve. If NOAA determines, based on the scope of the project and the issues associated with the additional site(s), that an environmental assessment is sufficient to establish a multiple-site Reserve, then the state shall develop a revised management plan which, concerning the additional component, incorporates each of the elements described in §921.13(a). The revised management plan shall address goals and objectives for all components of the multi-site Reserve and the additional component's relationship to the original site(s).

(c) The state shall revise the management plan for a Reserve at least every five years, or more often if necessary. Management plan revisions are subject to (a) above.

(d) NOAA will approve boundary changes, amendments to management plans, or the addition of multiple-site components, by notice in the FEDERAL REGISTER. If necessary NOAA will revise the designation document (findings) for the site.

Subpart E—Ongoing Oversight, Performance Evaluation and Withdrawal of Designation

§921.40 Ongoing oversight and evaluations of designated National Estuarine Research Reserves.

(a) The Sanctuaries and Reserve Division shall conduct, in accordance with section 312 of the Act and procedures set forth in 15 CFR part 928, ongoing oversight and evaluations of Reserves. Interim sanctions may be imposed in accordance with regulations promulgated under 15 CFR part 928.

(b) The Assistant Administrator may consider the following indicators of non-adherence in determining whether to invoke interim sanctions:

(1) Inadequate implementation of required staff roles in administration, research, education/interpretation, and surveillance and enforcement. Indicators of inadequate implementation could include: No Reserve Manager, or no staff or insufficient staff to carry out the required functions.

(2) Inadequate implementation of the required research plan, including the monitoring design. Indicators of inadequate implementation could include: Not carrying out research or monitoring that is required by the plan, or carrying out research or monitoring that is inconsistent with the plan.

(3) Inadequate implementation of the required education/interpretation plan. Indicators of inadequate implementation could include: Not carrying out education or interpretation that is required by the plan, or carrying out education/interpretation that is inconsistent with the plan.

(4) Inadequate implementation of public access to the Reserve. Indicators of inadequate implementation of public access could include: Not providing necessary access, giving full consideration to the need to keep some areas off limits to the public in order to protect fragile resources.

(5) Inadequate implementation of facility development plan. Indicators of inadequate implementation could include: Not taking action to propose and budget for necessary facilities, or not undertaking necessary construction in a timely manner when funds are available.

(6) Inadequate implementation of acquisition plan. Indicators of inadequate implementation could include: Not pursuing an aggressive acquisition program with all available funds for that purpose, not requesting promptly additional funds when necessary, and evidence that adequate long-term state control has not been established over some core or buffer areas, thus jeopardizing the ability to protect the Reserve site and resources from offsite impacts.

(7) Inadequate implementation of Reserve protection plan. Indicators of inadequate implementation could include: Evidence of non-compliance with Reserve restrictions, insufficient surveillance and enforcement to assure that restrictions on use of the Reserve are adhered to, or evidence that Reserve resources are being damaged or destroyed as a result of the above.

(8) Failure to carry out the terms of the signed Memorandum of Understanding (MOU) between the state and NOAA, which establishes a long-term state commitment to maintain and manage the Reserve in accordance with section 315 of the Act. Indicators of failure could include: State action to allow incompatible uses of state-controlled lands or waters in the Reserve, failure of the state to bear its fair share of costs associated with long-term operation and management of the Reserve, or failure to initiate timely updates of the MOU when necessary.

§921.41 Withdrawal of designation.

The Assistant Administrator may withdraw designation of an estuarine area as a National Estuarine Research Reserve pursuant to and in accordance with the procedures of section 312 and 315 of the Act and regulations promulgated thereunder.

Subpart F—Special Research Projects

§921.50 General.

(a) To stimulate high quality research within designated National Estuarine Research Reserves, NOAA may provide financial support for research projects which are consistent with the Estuarine Research Guidelines referenced in §921.51. Research awards may be awarded under this subpart to only those designated Reserves with approved final management plans. Although research may be conducted within the immediate watershed of the Reserve, the majority of research activities of any single research project funded under this subpart may be conducted within Reserve boundaries. Funds provided under this subpart are primarily used to support management-related research projects that will enhance scientific understanding of the Reserve ecosystem, provide information needed by Reserve management and coastal management decision-makers, and improve public awareness and understanding of estuarine ecosystems and estuarine management issues. Special research projects may be oriented to specific Reserves; however, research projects that would benefit more than one Reserve in the National Estuarine Reserve Research System are encouraged.

(b) Funds provided under this subpart are available on a competitive basis to any coastal state or qualified public or private person. A notice of available funds will be published in the FEDERAL REGISTER. Special research project funds are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with §921.81(e)(4) (''allowable costs''), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

§921.51 Estuarine research guidelines.

(a) Research within the National Estuarine Research Reserve System shall be conducted in a manner consistent with Estuarine Research Guidelines developed by NOAA.

(b) A summary of the Estuarine Research Guidelines is published in the FEDERAL REGISTER as a part of the notice of available funds discussed in §921.50(c).

(c) The Estuarine Research Guidelines are reviewed annually by NOAA. This review will include an opportunity

for comment by the estuarine research community.

§ 921.52 Promotion and coordination of estuarine research.

(a) NOAA will promote and coordinate the use of the National Estuarine Research Reserve System for research purposes.

(b) NOAA will, in conducting or supporting estuarine research other than that authorized under section 315 of the Act, give priority consideration to research that make use of the National Estuarine Research Reserve System.

(c) NOAA will consult with other Federal and state agencies to promote use of one or more research reserves within the National Estuarine Research Reserve System when such agencies conduct estuarine research.

Subpart G—Special Monitoring Projects

§ 921.60 General.

(a) To provide a systematic basis for developing a high quality estuarine resource and ecosystem information base for National Estuarine Research Reserves and, as a result, for the System, NOAA may provide financial support for basic monitoring programs as part of operations and management under § 921.32. Monitoring funds are used to support three major phases of a monitoring program:

(1) Studies necessary to collect data for a comprehensive site description/characterization;

(2) Development of a site profile; and

(3) Formulation and implementation of a monitoring program.

(b) Additional monitoring funds may be available on a competitive basis to the state agency responsible for Reserve management or a qualified public or private person or entity. However, if the applicant is other than the managing entity of a Reserve that applicant must submit as a part of the application a letter from the Reserve manager indicating formal support of the application by the managing entity of the Reserve. Funds provided under this subpart for special monitoring projects are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with § 921.81(e)(4) (''allowable costs''), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

(c) Monitoring projects funded under this subpart must focus on the resources within the boundaries of the Reserve and must be consistent with the applicable sections of the Estuarine Research Guidelines referenced in § 921.51. Portions of the project may occur within the immediate watershed of the Reserve beyond the site boundaries. However, the monitoring proposal must demonstrate why this is necessary for the success of the project.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

Subpart H—Special Interpretation and Education Projects

§ 921.70 General.

(a) To stimulate the development of innovative or creative interpretive and educational projects and materials to enhance public awareness and understanding of estuarine areas, NOAA may fund special interpretive and educational projects in addition to those activities provided for in operations and management under § 921.32. Special interpretive and educational awards may be awarded under this subpart to only those designated Reserves with approved final management plans.

(b) Funds provided under this subpart may be available on a competitive basis to any state agency. However, if the applicant is other than the managing entity of a Reserve, that applicant must submit as a part of the application a letter from the Reserve manager indicating formal support of the application by the managing entity of the Reserve. These funds are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with § 921.81(e)(4) (''allowable costs''),

except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

(c) Applicants for education/interpretive projects that NOAA determines benefit the entire National Estuarine Research Reserve System may receive Federal assistance of up to 100% of project costs.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

Subpart I—General Financial Assistance Provisions

§921.80 Application information.

(a) Only a coastal state may apply for Federal financial assistance awards for preacquisition, acquisition and development, operation and management, and special education and interpretation projects under subpart H. Any coastal state or public or private person may apply for Federal financial assistance awards for special estuarine research or monitoring projects under subpart G. The announcement of opportunities to conduct research in the System appears on an annual basis in the FEDERAL REGISTER. If a state is participating in the national Coastal Zone Management Program, the applicant for an award under section 315 of the Act shall notify the state coastal management agency regarding the application.

(b) An original and two copies of the formal application must be submitted at least 120 working days prior to the proposed beginning of the project to the following address: Sanctuaries and Reserves Division Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, 1825 Connecticut Avenue, NW., suite 714, Washington, DC 20235. Application for Federal Assistance Standard Form 424 (Non-construction Program) constitutes the formal application for site selection, post-site selection, operation and management, research, and education and interpretive awards. The Application for Federal Financial Assistance Standard Form 424 (Construction Program) constitutes the formal application for land acquisition and development awards. The application must be accompanied by the information required in subpart B (predesignation), subpart C and §921.31 (acquisition and development), and §921.32 (operation and management) as applicable. Applications for development awards for construction projects, or restorative activities involving construction, must include a preliminary engineering report, a detailed construction plan, a site plan, a budget and categorical exclusion check list or environmental assessment. All applications must contain back up data for budget estimates (Federal and non-Federal shares), and evidence that the application complies with the Executive Order 12372, ''Intergovernmental Review of Federal Programs.'' In addition, applications for acquisition and development awards must contain:

(1) State Historic Preservation Office comments;

(2) Written approval from NOAA of the draft management plan for initial acquisition and development award(s); and

(3) A preliminary engineering report for construction activities.

§921.81 Allowable costs.

(a) Allowable costs will be determined in accordance with applicable OMB Circulars and guidance for Federal financial assistance, the financial assistant agreement, these regulations, and other Department of Commerce and NOAA directives. The term ''costs'' applies to both the Federal and non-Federal shares.

(b) Costs claimed as charges to the award must be reasonable, beneficial and necessary for the proper and efficient administration of the financial assistance award and must be incurred during the award period.

(c) Costs must not be allocable to or included as a cost of any other Federally-financed program in either the current or a prior award period.

(d) General guidelines for the non-Federal share are contained in Department of Commerce Regulations at 15 CFR part 24 and OMB Circular A–110.

Copies of Circular A–110 can be obtained from the Sanctuaries and Reserves Division; 1825 Connecticut Avenue, NW., suite 714; Washington, DC 20235. The following may be used in satisfying the matching requirement:

(1) Site selection and post site selection awards. Cash and in-kind contributions (value of goods and services directly benefiting and specifically identifiable to this part of the project) are allowable. Land may not be used as match.

(2) Acquisition and development awards. Cash and in-kind contributions are allowable. In general, the fair market value of lands to be included within the Reserve boundaries and acquired pursuant to the Act, with other than Federal funds, may be used as match. However, the fair market value of real property allowable as match is limited to the fair market value of a real property interest equivalent to, or required to attain, the level of control over such land(s) identified by the state and approved by the Federal Government as that necessary for the protection and management of the National Estuarine Research Reserve. Appraisals must be performed according to Federal appraisal standards as detailed in Department of Commerce regulations at 15 CFR part 24 and the Uniform Relocation Assistance and Real Property Acquisition for Federal land Federally assisted programs in 15 CFR part 11. The fair market value of privately donated land, at the time of donation, as established by an independent appraiser and certified by a responsible official of the state, pursuant to 15 CFR part 11, may also be used as match. Land, including submerged lands already in the state's possession, may be used as match to establish a National Estuarine Research Reserve. The value of match for these state lands will be calculated by determining the value of the benefits foregone by the state, in the use of the land, as a result of new restrictions that may be imposed by Reserve designation. The appraisal of the benefits foregone must be made by an independent appraiser in accordance with Federal appraisal standards pursuant to 15 CFR part 24 and 15 CFR part 11. A state may initially use as match land valued at greater than the Federal share of the acquisition and development award. The value in excess of the amount required as match for the initial award may be used to match subsequent supplemental acquisition and development awards for the National Estuarine Research Reserve (see also §921.20). Costs related to land acquisition, such as appraisals, legal fees and surveys, may also be used as match.

(3) Operation and management awards. Generally, cash and in-kind contributions (directly benefiting and specifically identifiable to operations and management), except land, are allowable.

(4) Research, monitoring, education and interpretive awards. Cash and in-kind contributions (directly benefiting and specifically identifiable to the scope of work), except land, are allowable.

§921.82 Amendments to financial assistance awards.

Actions requiring an amendment to the financial assistance award, such as a request for additional Federal funds, revisions of the approved project budget or original scope of work, or extension of the performance period must be submitted to NOAA on Standard Form 424 and approved in writing.

APPENDIX I TO PART 921—BIOGEOGRAPHIC CLASSIFICATION SCHEME

Acadian

1. Northern of Maine (Eastport to the Sheepscot River.)
2. Southern Gulf of Maine (Sheepscot River to Cape Cod.)

Virginian

3. Southern New England (Cape Cod to Sandy Hook.)
4. Middle Atlantic (Sandy Hook to Cape Hatteras.)
5. Chesapeake Bay.

Carolinian

6. North Carolinas (Cape Hatteras to Santee River.)
7. South Atlantic (Santee River to St. John's River.)
8. East Florida (St. John's River to Cape Canaveral.)

West Indian

9. Caribbean (Cape Canaveral to Ft. Jefferson and south.)
10. West Florida (Ft. Jefferson to Cedar Key.)

Louisianian

11. Panhandle Coast (Cedar Key to Mobile Bay.)
12. Mississippi Delta (Mobile Bay to Galveston.)
13. Western Gulf (Galveston to Mexican border.)

Californian

14. Southern California (Mexican border to Point Conception.)
15. Central California (Point Conception to Cape Mendocino.)
16. San Francisco Bay.

Columbian

17. Middle Pacific (Cape Mendocino to the Columbia River.)
18. Washington Coast (Columbia River to Vancouver Island.)
19. Puget Sound.

Great Lakes

20. Lake Superior (including St. Mary's River.)
21. Lakes Michigan and Huron (including Straits of Mackinac, St. Clair River, and Lake St. Clair.)
22. Lake Erie (including Detroit River and Niagara Falls.)
23. Lake Ontario (including St. Lawrence River.)

Fjord

24. Southern Alaska (Prince of Wales Island to Cook Inlet.)
25. Aleutian Island (Cook Inlet Bristol Bay.)

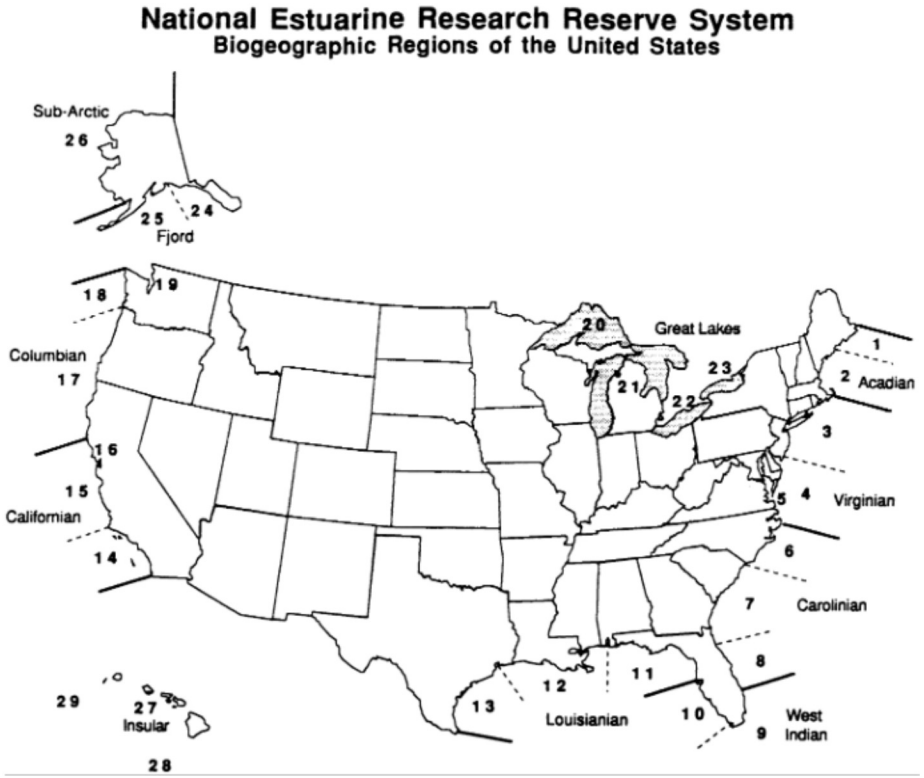
Sub-Arctic

26. Northern Alaska (Bristol Bay to Damarcation Point.)

Insular

27. Hawaiian Islands.
28. Western Pacific Island.
29. Eastern Pacific Island.

FIGURE 1



APPENDIX II TO PART 921—TYPOLOGY OF NATIONAL ESTUARINE RESEARCH RESERVES

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine reserves. Priority will be given to important ecosystem types as yet unrepresented in the reserve system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I—Ecosystem Types

Group I—Shorelands

A. Maritime Forest-Woodland. That have developed under the influence of salt spray. It can be found on coastal uplands or recent features such as barrier islands and beaches, and may be divided into the following biomes:

1. Northern coniferous forest biome: This is an area of predominantly evergreens such as the sitka spruce (Picea), grand fir (Abies), and white cedar (Thuja), with poor development of the shrub and herb leyera, but high annual productivity and pronounced seasonal periodicity.

2. Moist temperate (Mesothermal) coniferous forest biome: Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.

3. Temperate deciduous forest biome: This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern,

well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distinct subdivision of this biome is the pine edible forest of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. Broad-leaved evergreen subtropical forest biome: The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarine, strangler fig, gumbo limbo, and palms.

B. Coast shrublands. This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems and a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. Northern areas: Characterized by Hudsonia, various erinaceous species, and thickets of Myricu, prunus, and Rosa.

2. Southeast areas: Floral dominants include Myrica, Baccharis, and Iles.

3. Western areas: Adenostoma, arcotyphylos, and eucalyptus are the dominant floral species.

C. Coastal grasslands. This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (5 to 8 feet tall), such as Spartina, and trees such as willow (Salix sp.), cherry (Prunus sp.), and cottonwood (Pupulus deltoides.) This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: Elymus;
2. Northeast/West: Ammophla;
3. Southeast Gulf: Uniola; and
4. Mid-Atlantic/Gulf: Spartina patens.

D. Coastal tundra. This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as Empetrum nigrum and Betula nana, the lichens Cetraria and Cladonia, and herbaceous plants such as Potentilla tridentata and Rubus chamaemorus. Common species on the coastal beach ridges of the high arctic desert include Bryas intergrifolia and Saxifrage oppositifolia. This area can be divided into two main subdivisions:

1. Low tundra: Characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. High Tundra: A bare area except for a scanty growth of lichens and grasses, with underlaying ice wedges forming raised polygonal areas.

E. Coastal cliffs. This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and ''higher'' plant representatives.

GROUP II—TRANSITION AREAS

A. Coastal marshes. These are wetland areas dominated by grasses (Poacea), sedges (Cyperaceae), rushes (Juncaceae), cattails (Typhaceae), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) Tidal, which is periodically flooded by either salt or brackish water; (b) nontidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serve important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. Coastal swamps. These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. Coastal mangroves. This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by a variety of salt-tolerant trees, such as the red mangrove (Rhizophora mangle), black mangrove (Avicennia Nitida), and the white mangrove (Laguncularia racemosa.) It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. Intertidal beaches. This ecosystem has a distinct biota of microscopic animals, bacteria, and unicellular algae along with macroscopic crustaceans, mollusks, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (Emerita), amphipods (Gammeridae), ghost crabs (Ocypode), and bivalve mollusks such

as the coquina (Donax) and surf clams (Spisula and Mactra.)

E. Intertidal mud and sand flats. These areas are composed of unconsolidated, high organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dinoflaggellates, filamintous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell Donax, the scallop Pecten, tellin shells Tellina, the heart urchin Echinocardium, the lug worm Arenicola, sand dollar Dendraster, and the sea pansy Renilla. In mud, faunal dominants adapted to low oxygen levels include the terebellid Amphitrite, the boring clam Playdon, the deep sea scallop Placopecten, the Quahog Mercenaria, the echiurid worm Urechis, the mud snail Nassarius, and the sea cucumber Thyone.

F. Intertidal algal beds. These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. Northern latitude rocky shores: It is in this region that the community structure is best developed. The dominant algal species include Chondrus at the low tide level, Fucus and Ascophylium at the mid-tidal level, and Laminaria and other kelplike algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.

2. Southern latitudes: The communities in this region are reduced in comparison to those of the northern latitudes and possesses algae consisting mostly of single-celled or filamentour green, blue-green, and red algae, and small thalloid brown algae.

3. Tropical and subtropical latitudes: The intertidal in this region is very reduced and contains numerous calcareous algae such as Porolithon and Lithothamnion, as well and green algae with calcareous particles such as Halimeda, and numerous other green, red, and brown algae.

GROUP III—SUBMERGED BOTTOMS

A. Subtidal hardbottoms. This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as keep, may also be found.

B. Subtidal softbottoms. Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. Subtidal plants. This system is found in relatively shallow water (less than 8 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions, manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass Zostera marina predominates. In the South Atlantic and Gulf coast areas, Thalassia and Diplanthera predominate. The grasses in both areas support a number of epiphytic organisms.

Class II—Physical Characteristics

GROUP I—GEOLOGIC

A. Basin type. Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. Exposed coast: Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area making them chief stabilizers of the ocean shorefront.

2. Sheltered coast: Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters-abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects pollution being more severe in this area than in exposed coastal areas.

3. Bay: Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced the flushing action is augmented by

river discharge. Bays vary in size and in type of shorefront.

4. Embayment: A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.

5. Tidal river: The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.

6. Lagoon: Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.

7. Perched coastal wetlands: Unique to Pacific islands, this wetland type found above sea level in volcanic crater remnants forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. EXAMPLE: Aunu's Island, American Samoa.

8. Anchialine systems: These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs have only a subsurface connection in the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthis algae such as Rhizoclonium, the mineral encrusting Schiuzothrix, and the vascular plant Ruppia maritima. Characteristic fauna which exhibit a high degree of endemicity, include the mollusks Theosoxus neglectus and Tcariosus. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. Basin structure. Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. Coastal plains estuary: Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular forming a simple coastal plains estuary. When a channel is flooded with numerous tributaries an irregular estuary results. Many estuaries of the eastern United States are of this type.

2. Fjord: Estuaries that form in elongated steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume river discharge is small. But many fjords have restricted tidal ranges at their mouths due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800m to 1200m while sill depths usually range from 40m to 150m.

3. Bar-bounded estuary: These result from the development of an offshore barrier such as a beach strand, a line of barrier islands, reef formations a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars of barrier islands broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent seal level rises.

4. Tectonic estuary: These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding or movement of the earth's bedrock often with a large inflow of freshwater.

5. Volcanic estuary: These coastal bodies of open water, a result of volcanic processes are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic orgin.

C. Inlet type. Inlets in various forms are an integral part of the estuarine environment as they regulate to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea.

1. Unrestricted: An estuary with a wide unrestricted inlet typically has slow currents, no significant turbulence, and receives the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.

2. Restricted: Restrictions of estuaries can exist in many forms: Bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if

the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a tidal wave, or bore. Such currents exert profound effects on the nature of the subtrate, turbidity, and biota of the estuary.

3. Permanent: Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea.

4. Temporary (Intermittent): Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea, and sound waters, the frequency of storms, and the amount of littoral transport.

D. Bottom composition. The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. Sand: Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shore and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a graduation toward finer particles in the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.

2. Mud: At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silts, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.

3. Rock: Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. Oyster shell: Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

GROUP II—HYDROGRAPHIC

A. Circulation. Circulation patterns are the result of combined influences of freshwater inflow, tidal action, wind and oceanic forces, and serve many functions: Nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. Stratified: This is typical of estuaries with a strong freshwater influx and is commonly found in bays formed from ''drowned'' river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.

2. Non-stratified: Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.

3. Lagoonal: An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater influx and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. Tides. This is the most important ecological factor in an estuary as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of the cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as datum. The tides, although complex, fall into three main categories:

1. Diurnal: This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.

2. Semidiurnal: This refers to a twice daily rise and fall in water that can be observed along the shoreline.

3. Wind/Storm tides: This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. Freshwater. According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the

land either from a surface and/or subsurface source.

1. Surface water: This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.

2. Subsurface water: This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water:

a. Vadose water: This is water in the soil above the water table. Its volume with respect to the soil is subject to considerable fluctuation.

b. Groundwater: This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land being high hills and sloping into valleys.

GROUP III—CHEMICAL

A. Salinity. This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand-ppt.)

1. Positive estuary: This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.

2. Negative estuary: This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.

3. Salinity zones (expressed in ppt):

a. Hyperhaline—greater than 40 ppt.

b. Euhaline—40 ppt to 30 ppt.

c. Mixhaline—30 ppt to 0.5 ppt.

(1) Mixoeuhaline—greater than 30 ppt but less than the adjacent euhaline sea.

(2) Polyhaline—30 ppt to 18 ppt.

(3) Mesohaline—18 ppt to 5 ppt.

(4) Oligohaline—5 ppt to 0.5 ppt.

d. Limnetic: Less than 0.5 ppt.

B. pH Regime: This is indicative of the mineral richness of estuarine waters and falls into three main categories:

1. Acid: Waters with a pH of less than 5.5.

2. Circumneutral: A condition where the pH ranges from 5.5 to 7.4.

3. Alkaline: Waters with a pH greater than 7.4.

PART 922—NATIONAL MARINE SANCTUARY PROGRAM REGULATIONS

Subpart A—General

Subpart B—Site Evaluation List (SEL)

Subpart C—Designation of National Marine Sanctuaries

Subpart D—Management Plan Development and Implementation

Subpart E—Regulations of General Applicability

Appendix B. Moʻolelo of Heʻeia: Oral Traditions from the Heʻeia Estuary Area

Moʻolelo of Heʻeia: Oral Traditions from the Heʻeia Estuary Area

The places within the Heʻeia Estuary, as with other Hawaiian places, have had their history preserved since antiquity through oral traditions. Among the oral traditions found to document the history of the Heʻeia Estuary are moʻoleo, or traditional stories; ʻōlelo noʻeau, or wise sayings; oli, or poetic chants that are not accompanied by dance; and mele, or poetic compositions which may be danced to including those modern compositions accompanied by musical instruments. Moʻolelo is a term "embracing many kinds of recounted knowledge, including history, legend, and myth. It included stories of every kind, whether factual or fabulous, lyrical or prosaic. Moʻolelo were repositories of cultural insight and a foundation for understanding history and origins, often presented as allegories to interpret or illuminate contemporary life… Certainly many such [oral] accounts were lost in the sweep of time, especially with the decline of the Hawaiian population and native language" (Nogelmeier 2006:429,430). Like Nogelmeier's description of moʻolelo, the ʻōlelo noʻeau, oli, and mele all contribute to the cultural understanding of the Heʻeia Estuary. The oral traditions which pertain to the Heʻeia Estuary are shared in this appendix.

Moʻolelo

There are a number of moʻolelo connected to the lands within the Heʻeia Estuary project which have been passed down throughout the generations. The kūpuna still share these stories. Some of these accounts have been documented in the old Hawaiian language newspapers. Other accounts have been recorded in the relatively recent reports put together by archaeologists and anthropologists working in the area. Some of these stories attach significance to the naming of places such as Heʻeia, Heʻeia Kea, Heʻeia Uli, Koʻamanō, Moku o Loʻe, and Keahiakahoe. Other stories talk about the guardian spirits within Heʻeia, namely Meheanu and Lupekiaʻinui.

Naming of Heʻeia

1) Groza and Monahan (2012), crediting Pukui's *Place Names of Hawaii*, say Heʻeia is the foster son of Haumea; the grandson of ʻOlopana; and the uncle of Kamapuaʻa. [However, I have not been able to find the aforementioned reference to Kamapuaʻa].

> -Haumea names him Heʻeia because "they had been washed out to sea," and eventually, the district "adjoining Kaneohe was named for him" (Sterling and Summers 1978:197).
>
> -At Koʻolau, Heʻeia meets and falls in love with Kaʻohelo, the younger sister of Pele and Hiʻiaka. According to Beckwith's Legend of Kaohelo, the handsome Heʻeia abandons Kaʻohelo for another woman. A sister of Kaʻohelo named Malulani grieves for Kaʻohelo's loss. In her grief, Malulani hangs herself, and Kaʻohelo forms the little hills of Heʻeia district out of her sister Malulani's body (Sterling and Summers 1978:201).

2) Pukui offers an additional explanation for the naming of Heʻeia:

> "During a battle with people from Leeward Oʻahu, a tidal wave is said to have washed (heʻe ʻia) the natives out to sea and back, after which they were victorious, thus fulfilling a prophecy" (Pukui et al 1974:44)

3)Yet another story may have contributed to the naming of Heʻeia as originally told by Paki in 1972. According to this account, Heʻeia figuratively means "The Envious Challenge." There were two chiefly brothers, both skilled in surfing, who lived in the area. The older brother was envious of the other and challenged him to a surfing contest of which the loser of the contest would lose his life. Due to the older brother's envy and ill-willed intent of the surfing contest, he was swept out to sea and perished. His cries of "Heʻeia! Heʻeia!" can still be heard today (Henry 1993).

Here is the story of the two chiefly brothers of Heʻeia as it was published, quoting Paki, in *Heʻeia Fishpond, Loko Iʻa O Heʻeia, An Interpretive Guide for the Heʻeia State Park Visitor:*

> *HEʻEIA, THE ENVIOUS CHALLENGE*
>
> *The figurative interpretation of the name Heʻeia is the Envious Challenge. The Heʻeia coastline of Oʻahu is famous for Heʻe, or Octopus-fish, which swarm in these waters at a certain time each year. When the Wili-wili tree crimsons with its claw-like blossoms, fishermen know the Heʻe are running.*
>
> *Once there were two brothers, both chiefs in this thriving community of Heʻeia. Both men were champions in the art of Heʻe-nalu, or wave-surfing, and both were handsome figures.*
>
> *However, the older brother was shorter, and for this reason envied his younger relative. The neighbors contributed to the older one's feeling of inferiority and jealousy, by forever comparing the two men and praising the younger one's tall, erect figure, his mien of chiefly dignity. In those days, a chief should be able to look over and above the heads of others.*
>
> *Finally, the envious brother challenged the younger favorite to a contest in surfing. As usual, the wager was large and included full title to all the family possessions and the loser's very life.*
>
> *Surfing at that particular time was very dangerous. Often the monster octopus of the deep ocean depths swarmed with their smaller cousins. The Heʻe were running and the Wili-wili blossoms were clustered on the branches like jewels of blood. But the challenge made had to be accepted as was the custom of the times. Had the younger man refused to accept the duel, the people would have judged him to be cowardly. A chief's Mana or Power, should protect him even from any huge, man-devouring Heʻe of the depths.*

The Kana-wai or Law, teaches that mortals should be content with their lot in life and make the best of it and feel truly thankful. Therefore, when the older brother broke this law he had to receive just punishment from the Akua, or Deity.

In punishment, the older brother was caught in the rip tide and taken down among the He'e-nui, the huge devils of the deep sea.

Today, at the swarming time of the He'e, each year, during the season of Fall-Into-Winter when the Wili-wili blossoms redly, you should listen carefully. You can hear, on the stillness of the night, the muffled voice of the older brother calling to his younger brother, his tones lamenting, "He'eia! He..ee..i..a!" in the later October to December and January when the surf rides high upon the shore of He'eia (Henry 1993:40).

The Division of He'eia Kea & He'eia Uli

Kupuna and Kumu Hula Al Makahinu Barcarse relates the significance of Ke'alohi Point as being the boundary between He'eia Kea to the north and He'eia Uli to the south. Aunty Rocky Kaluhiwa says that Ke'alohi Point is a leina 'uhane for the souls of the departed. The deceased were judged here and sent to either side depending on whether or not they were good or bad people. Kumu Barcarse explains:

> "Kealohi Point was where the kahu [caretaker] would decide whether a dead person was black [uli] or white [kea]. The [south] side of Kealohi Point, where the He'eia Fishpond is, was named He'eia-uli. The [north] side of the Point was He'eia-kea. The body of a dead person who was judged black, or who was bad, was fed to the sharks and their body cast to He'eia-uli. Those who were good, or white, were buried and their spirit was cast to He'eia-kea" (Cruz and Hammatt 2012:62).

The Caretaker Makanui

Ma kai of He'eia Fishpond is a reef known as Ko'amanō, and its numerous caves housed a great number of sharks. According to McAllister, Makanui was the caretaker of these sharks; he lived on land northwest of the fishpond (Summers 1978). Kumu Barcarse relates the story of Makanui feeding the bodies of the recently deceased to his sharks unbeknownst to the people of He'eia. Eventually the people found out, and when they did, they fed Makanui to the sharks in revenge (Cruz and Hammatt 2012).

Here is the story of Makanui as it was published, quoting McAllister, in *Sites Of Oahu*:

Koamano Reef

Koamano reef [is a] short distance out from Heeia fishpond. The reef is oval in shape and not very large. All about the reef are caves where a great number of sharks dwell. If you listen from the reef today you can frequently hear them breathing heavily in sleep. Makanui, the keeper of these sharks, lived on the land on the northwest side of the Pond. He spent most of his time feeding the sharks, which was quite an undertaking. For a long time it had been noticed that the bodies of the dead had been disappearing. After the death of a person, someone would be chosen to watch over the body, but as frequently happened, the watcher would fall asleep, and upon awakening the corpse would be gone. This happened for some time, until it was discovered that in the night the sharks of Makanui would come from the sea and carry off the dead to the caves of Koamano. The people were so enraged that they took revenge upon Makanui and fed his body to the sharks (Sterling and Summers 178:198).

The Guardian Meheanu

Meheanu was the guardian or kiaʻi of Heʻeia who lived next to Heʻeia Fishpond at Luamoʻo. Among her kinolau was a lizard, a frog, or her favorite, an eel (Henry 1993). Aunty Rocky Kaluhiwa notes that Meheanu is the ʻaumakua of Heʻeia Fishpond, and Meheanu's presence has been manifested in the past by a multitude of intertwined eels within the fishpond walls. According to Kumu Barcarse, as told to him by Grandfather Kamaka, Meheanu made sure that the people of Heʻeia had fish during times of famine, and her presence was especially signified by the yellowing of the hau flowers (Cruz and Hammatt 2012).

The Guardian Lupe-kiaʻi-nui

Lupekiaʻinui, the great stingray, was another guardian of Heʻeia Fishpond. Lupekiaʻinui was from Kekepa Island near Mōkapu, but he moved to Heʻeia Fishpond after being solicited for help from the overseer of the fishpond. According to the moʻolelo, the overseer of the fishpond was distraught because his prized mullet were being eaten by barracudas and were also being stolen by thieves. So the overseer paddled to Kekepa Island to enlist the help of the great stingray Lupekiaʻinui. A pact was made between the two whereby Lupekiaʻinui would rid the fishpond of thieving people and trespassing barracudas if the overseer would promise to keep the fishpond there for eternity. The overseer agreed. In return, Lupekiaʻinui moved to Heʻeia Fishpond to dwell there; ensured the safety of the mullet from thieves and barracudas; and as a result the fishpond has survived throughout the generations until today (Henry 1993).

Here is the story of Lupekiaʻinui as it was published in *Heʻeia Fishpond, Loko Iʻa O Heʻeia, An Interpretive Guide for the Heʻeia State Park Visitor:*

LUPE-KIAʻI-NUI

The konohiki (overseer) of Heʻeia Fishpond knew that he needed to solicit the help of a squadron of sting rays (hīhīmanu) that lived at Kekepa Island, near Mokapu, to watch over his pond. He paddled his canoe out to the island and prayed to the god of the hīhīmanu, "Oh, hīhīmanu akua, I need your guardian services. I need you to help save my crop of ʻamaʻama. The kākū (barracuda) and ʻaihue loko (pond robbers) are stealing me blind! I will do anything to get your help."

"Anything?" the voice from above bellowed as the konohiki bounced around in his little canoe.

"Yes, anything," he replied.

"I want you to promise me that your fishpond will always be a fishpond and will be a fishpond for your children and a fishpond for their children and their children to come forever," the voice resounded.

"'Ae, ʻae," the konohiki answered. "Yes, yes, my fishpond will be another monument to the genius of my people forever and ever and ever!"

With that, the water started to churn and spin the canoe around as hundreds of hīhīmanu in the water rushed and glided in a circle around him. The canoe spun around and around as he was dizzily sucked in to the darkness of the wiliwai (whirlpool) that consumed him.

When he came out of the whirlpool, the konohiki as being pulled across the bay by a large hīhīmanu that was flying across the sky like a kite (which it resembled); the kite-string, made of olonā, was over a mile long. This special hīhīmanu was the legendary Lupe-kiaʻi-nui, the super-watching sting ray.

Because Heʻeia Fishpond was one of the largest ponds along the shore, it needed a special sting ray to dwell there. That is why Lupe-kiaʻi-nui, the super sting ray, was assigned to this Fishpond. At times, Lupe-kiaʻi-nui would visit his friends and family at Kekepa. He would wing his way between the reefs and coral heads. When returning, he would fly over the wall in to the fishpond.

Lupe-kiaʻi-nui made his home near the mākāhā-nui (large- water-control gate). From this advantageous spot, he could watch the fishpond walls and all that happened in the large body of the pond. He could swiftly fly to any spot when he sensed a predator or intruder. He would kill a predator and eat it; kākū were good eating too. Sometimes when there were many to be taken, he would call to his friends at Kekepa. At such times, the waters of the pond would sparkle and glow in the night as many hīhīmanu whipped and lashed out at the predators.

Lupe-kiaʻi-nui would slash human pond robbers to death with his whiplike tail and tow the human carcass to his manō (shark) friends that lived at Koʻamanō Reef, a short distance from the pond. After stripping the flesh from the bodies, the sharks would bury the bones of the ʻaihue loko in shallow holes along the sandy shore near the mouth of Heʻeia Stream. Fishermen knew that this area was a good source of human bones to make fish hooks.

To this day, the word of the konohiki has been kept to the hīhīmanu akua. Heʻeia Fishpond is still a fishpond. At times during the year, the water of the pond will sparkle and glow in the night as it is whipped and lashed by the legendary hīhīmanu chasing the kākū. Sharks still live at Koʻamanō Reef. Bones of the ʻaihue loko are still being found at the mouth of Heʻeia Stream (Henry 1993:39).

The Siblings Loʻe, Pahu, and Kahoe

According to Kumu Barcarse, there were three siblings named Loʻe, Pahu, and Kahoe. Loʻe lived on Moku o Loʻe; Pahu lived near Heʻeia Fishpond; and Kahoe lived in the mountains of the ahupuaʻa. The sibling named Pahu, who lived near the fishpond, was known to be greedy, and gave away the less desirable fish to others while keeping the best only for himself. In return, during times of famine when there were no fish, the sibling named Kahoe, who lived in the mountains, carefully cooked his upland crops in a cave in the hopes that the others would not see the smoke from his oven and know that he was cooking (Cruz and Hammatt 2012). This area of upland cliffs where Kahoe lived is now called Keahiakahoe, meaning 'The fire of Kahoe.'

The Supernatural Twins Hilu-ula & Hilu-uli

In Thrum's *Hawaiian Folk Tales*, the story is told about the brother and sister twins Hilu-ula and Hilu-uli. The sister Hilu-uli is credited with bringing the hilu fish, or wrasse, to the shores of Heʻeia and Kāneʻohe. Before that, it had not been known to those people of the Koʻolau. The story is recounted in *Sites Of Oahu*:

Hilu-ula and Hilu-uli were born twins, one a male and the other a female. They had human forms, but with power to assume that of the fish now known as hilu. The two children grew up together and in due time when Hilu-uli, the sister, was grown up, she left her brother and parents without waying a word and went in to the sea, and, assuming her fish form, set out on a journey she increased the numbers of the hilu so that they came close to Heeia there was so large a school that the sea was red with them. When the people of Heeia and Kaneohe saw this, they paddled out in their canoes to discover that it was a fish they had never seen nor heard of before. Returning to the shore for nets, they surrounded the school and drew in so many that they were not able to care for them in their canoes. The fishes multiplied so rapidly that when the first school was surrounded and dragged ashore, another one appeared, and so on, till the people were surfeited. Yet the fish stayed in the locality,

circling around. The people ate of them in all styles known to Hawaiians; raw, lawalued, salted, and broiled over a fire of coals.

While the Koolau people were thus fishing and feasting, Hilu-ula, the brother, arrive among them in his human form; and when he saw the hilu-uli broiling over the coal fire he recognized the fish form of his sister. This so angered him that he assumed the form of a whirlwind and entered every house where they had hilu and blew the fish all back into the sea. Since then the hilu-uli has dark scales, and is well known all over the islands (Sterling and Summers 1978:202).

The Supernatural Woman Kamehaikana

One more story is told about a supernatural being, this one named Kamehaikana. Kamehaikana was a woman from the uplands who went to Keʻalohi and Heʻeia Kea to get food from the sea. A piece of morning-glory vine, also known as pōhuehue, grew on the banks of the spring where she once washed her bounty from the sea. This story was published in the Hawaiian language newspaper, Ka Nupepa Kūʻokoʻa, in August of 1896; it was reprinted as follows in *Sites Of Oahu*:

Kamehaikana was a beautiful woman for this place, Iolekaa, in those days of old Hawaii. She was a supernatural woman. Her husband was Makea (Wakea). One day, she went to the sea at Kealohi to fish and came to Heeia-kea. She went down to the beach to catch crabs and gather sea weeds. Then she went up to Haakolea where there was a spring. There she washed the sea weeds and crabs. The crabs ran about and the sea weeds were found growing in the spring, said the ancients. The surplus piece of pohuehue vine which she wore about her was broken off and thrown down where she washed the sea weeds and crabs. The pohuehue vine grew at the edge of the spring (Sterling and Summers 1978:200).

ʻŌlelo Noʻeau

Only one ʻōlelo noʻeau pertaining to Heʻeia was recorded in the documentation done by Pukui in her book *ʻŌlelo Noʻeau: Hawaiian Proverbs & Poetical Sayings*:

(1561)

Ka ua kani koʻo o Heʻeia.

The rain of Heʻeia that sounds like the tapping of walking canes.

Also said of the rain of Hilo (Pukui 1982:168).

This ʻōlelo noʻeau paints a picture that reminds everyone of the generous amounts of rain which waters this windward district of Oʻahu.

OLI

Among the chants found which mention Heʻeia are two published in the booklet *Heʻeia Fishpond, Loko Iʻa O Heʻeia: An Interpretive Guide for the Heʻeia State Park Visitor,* and another which has been passed down orally from Kumu Hula Al Makahinu Barcarse. The chant from Kumu Barcarse is a chant of welcome which first acknowledges the guardian Meheanu and then invites the listeners to a happy gathering in Heʻeia:

Pala luhiehu ka hau o Luamoo

A noho o Meheanu i ka malie

E na malihini, na pua kahiki i hiki mai e

Welina, welina no

Mai na pali o Haiku a i ka lae o Kealohi

Heeia Kea, Heeia Uli kani lea lea e

Lea hauoli hoi Ahuimanu

A hui mai kakou e launa pu i ka poli uluwehi o Heeia

Eia makou na pua e mohala nei i ka ua kilihune

E inu i ka awa o Iolekaa

E ku paakai i ka amaama o Kalimuloa

O ko makou wahi opu weuweu la no oukou ia

Aloha no, aloha e

(Source: Kumu Hula Al Makahinu Barcarse)

Of the two chants found in the Heʻeia interpretive guide, one is printed in English and is credited to Paki in 1972. And the other is printed in Hawaiian with an English translation, credited to Lanakila Henry who composed it in 1976. The first chant is entitled "Heʻeia, A Chant":

HEʻEIA, A CHANT

There were, and are

Two place-names, He‘eia.

One is He‘eia-uli, The Dark He‘eia;

The other, He‘eia-kea, Fair He‘eia.

There is all the difference

Between these two,

He’eia-uli and He‘eia-kea,

As is the difference Of Night and Day.

Men died in Old Hawai‘i…

The entered places

Where dead Men dwell.

But the difference here,

At He‘eia,

The dead men entered

The Depths of the Seas.

Their lives were judged,

Their Fate decreed,

With some judged white

And some called black.

The black souls leaped

From the left-hand shore;

The white souls jumped

From the right-hand shore;

He‘eia, here, the Dividing Line.

Now, if you will,

Look into the sea

Where sand-strip islands

Are close to shore.

Watch, for this is a mystery,

Now they appear;

Now they are gone.

You may judge it a trick

Of the Tide and the Sea,

But in reality,

It is the Shadows

Falling strangely

Upon the Sun-lit waves.

Neither the light,

Nor tide to be blamed,

For the Force that controls

Is the Will of the Gods,

A Decree that was made,

In the time of Antiquity.

How it happened,

So the story gels,

There were, and are,

On He‘eia’s shore,

Various fishing grounds,

Each with its own,

Its protective Gods.

Gods, like men,

Often disagreed,

Thus, two of the Gods

Who controlled these grounds,

Quarreled on a matter of

Right and Wrong,

As who should be fishing

He‘eia’s Shores!

The Man-god of He‘eia-kea

Was fishing in Koolau Bay,

The Man-god of He’eia-uli

Became justly enraged.

He sent a challenge

To the poaching god,

Proposing a battle

For control of the shores.

They met and fought

'Til the righteous god won.

However, he proved himself to be

A god of kindly heart,

He made a pact with He'eia-kea,

White god of Koolau,

And, speaking gently, said,

From this time forth,

And forever more,

You White Gods of He'eia

Fish from Kualoa Shore;

And Dark Gods of He'eia-uli

Fish Kane'ohe shores;

He'eia is the Dividing line.

So it was settled and agreed,

The flat, sandy-strips

Be Deciding line.

Now, here is a warning

To men of today,

When Sandstrip appears

Beneath the waves

It is time to turn

Your boats around

(Source: Paki, 1972)

And the second chant is entitled, "Loko I'a O He'eia (A Modern Chant)":

LOKO I'A O HE'EIA (A MODERN CHANT)

I.

Kapapa ka piko o Kāne'ohe

Kapapa lies in the center of Kāne'ohe Bay;

Kaikuone ne'ine'i nani Ko'olau

The bay that sits beneath the beautiful Ko'olau

Pu'u Keahiakahoe iluna

With its high peaks of Keahiakahoe and

A ho'ou'ou lani o ka pu'u Eleao

Eleao jutting skyward.

II.

Mano wai Ha'ikū a Ioleka'ā

Fresh water from Ha'ikū and Ioleka'a Valleys

Hui kaha wai He'eia papalalo

Flow as He'eia Stream to where the land

Pili ma kai Lae O Ke 'Alohi

And sea meet by Ke 'alohi Point under a fine

Wahi ho'okili hu'e ānuenue

Light rain that produces a rainbow

III.

Na pua kukuna-o-ka-lā

The flowers of the mangrove are like

Kohu hoku ʻimoʻimo

Twinkling stars.

Pāpōhaku hoʻopuni ia kūlana

The stonewall that surrounds this place

Loko hea ola a kapu iʻa

Where fish that are raised in ponds live and grow.

IV.

Heʻeia puʻuone loko iʻa

Heʻeia (fishpond) of beautiful Kāneʻohe (Bay)

Nani Kāneʻohe kaikuʻone

The fishpond near the shore;

Hoʻoheno no hoʻi ʻia oe

Cherish it in thought

Kia hoʻomano na wā hala

As a monument to recall the past.

V.

Haina ʻia mai kapuana;

This is the end of my song-story.

Hoʻolaulima kū nā kupuna

Let us work it in the manner of our ancestors;

Mālama no ka loko iʻa

Let us preserve the fishpond

Hoʻomau neia waiwai hoʻoilina.

To continue this part of our heritage.

(Created by: Lanakila Henry, 1976)

(Henry 1993:42)

Mele

Finally, a few mele which mention Heʻeia are found archived in the Huapala database of Hawaiian chants and songs. The first of these songs is the Hawaiian standard, "Nani Kaʻala." This song, with traditional double meanings, takes the listener on a trip to specific places around Oʻahu Island. In the middle of the song, the composer stops in Heʻeia and finds love there. The second song, "Kāneʻohe," is a song written by Abbie Kong and Johnnie Noble in the 1930s. Instead of journeying around the island, this song only mentions places within the district of Koʻolaupoko, specifically Kāneʻohe with its lights, Mōkapu with its sea spray, and Heʻeia with its naturally jagged ridges and modern telegraph wires. The third mele, "A Honolulu Au," is annotated to be a hula paʻi umauma, or a song which can be accompanied by a chest-slapping dance. This mele was written specifically for the students of the Kamehameha Schools Explorations Program. It commemorates the many field trips that the students took during their schooling, and for Heʻeia, it remembers their boat ride there. The lyrics to all three of these mele are presented below. (Lyrics and translation to these songs along with their accompanied descriptions are from the www.huapala.org database compiled by Kanoa-Martin):

<u>Nani Kaʻala</u>

He nani Kaʻala, lae, la lae lae

Kuahiwi nani ʻoe, lae, la lae lae

I Nuʻuanu au, lae, la lae lae

Ka makani Koʻolau, lae, la lae lae

I Kailua au, lae, la lae lae

Huki mai ka ulua, lae, la lae lae

I Kaneʻohe au, lae, la lae lae

I ka ʻohe kaulana, lae, la lae lae

I Heʻeia au, lae, la lae lae

Eia aʻe ke aloha, lae, la lae lae

I Waiahole au, lae, la lae lae

He kanaka pihole, lae, la lae lae

I Waikane au, lae, la lae lae

He kane hana nui, lae, la lae lae

Haʻina Kaʻala, lae, la lae lae

Kuahiwi nani ʻoe, lae, la lae lae

Beautiful is Kaʻala

You are a beautiful mountain

I was at Nuʻuanu

The wind of the Koʻolaus

I was at Kailua

Pulling in a jackfish

I was at Kaneʻohe

Famous for the utility towers

I was at Heʻeia

Here is love

I was at Waiahole

A very flirtatious man

I was at Waikane

A hard working man

Tell of Ka‘ala

You are a beautiful mountain

Source: Puke Mele by Kimo Alama – Ka‘ala, the highest mountain on O‘ahu is symbolic of a woman, possibly seeking a mate. She travels to the districts on O‘ahu and relates her various encounters with different men. Lae la lae lae is tra la la la. Ulua in verse #3 is a lover

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<u>*Kāne‘ohe*</u>

`Ōlapa ka uila i Kāne‘ohe
Ka hui laulima o ‘i Laniwai

**(Ka hui lau lima Hi‘ilaniwai)*
Hui:
Me ka ua Apuakea
Ka la‘i a‘o Malūlani (Mololani)
Me ka anu o ke Ko‘ōlau

Kaulana mai nei Ko‘olaupoko
Ua ‘ā ka uila a‘i Kāne‘ohe

Hanohano Mōkapu i ka ‘ehu kai
Te tua motumotu a‘o He‘eia

Ho‘okahi meahou ma He‘eia
Ka uwea kelekalepa leo nahenahe

Aia ‘ike lihi o ka ‘āina
Kahi a ke aloha i walea ai

Walea ana ʻoe me ke onaona
Kuʻu lei hulu mamo pili i ke anu

Ua ana hoʻi au a i kō leo
Kō pane ʻana mai pehea au

Haʻina ʻia mai ana ka puana
Ua ʻā ka uila aʻi Kāneʻohe

Light flashes at the Kaneohe

Co-operative Society of Laniwai

*alternate stanza

Chorus:

The Apuakea rain

The peace of Malulani

The coolness of the Koʻolau

Famous is Koʻolaupoko

The lights go on at Kaneohe

The glory of Mokapu is the sea spray

And the jagged ridge of Heeia

The news at Heʻeia

Sweet-voiced telegraph wire

Glimpses of the land

Where love finds delight

Delight with the sweet one

My mamo feather lei in the coolness

Delighted by your voice

You ask, How am I?

Tell the refrain

The light goes on at Kaneohe

Source: Nā Mele o Hawai‘i Nei by Elbert & Mahoe - Written in the 1930's to commemorate the installation of electricity at Kaneohe, the mele also tells of a delightful love affair on the windward side of Oahu.

A Honolulu Au

A Honolulu au la

E maka‘ika‘i la

A Waikīkī au la

Hoe i ka wa‘a la

A He‘eia au la

Holo ma ka moku la

A Mōkapu au la

‘Āina o nā ali‘i la

A Pu‘uloa au la

‘O ke awa lau la

A Makapu‘u au la

Ho‘ohula no na nai‘a la

A Hale‘iwa au la

I ka loʻi kalo la

A Maunalua au la

Aloha i nā kupuna la

A Nuʻuanu au la

ʻIke i na kiʻi la

Haʻina mai ka puana la

No Honolulu la ʻea

I am at Honolulu

To see the sights

At Waikiki

Paddle the canoe

At Heʻeia

Ride the boat

At Mōkapu

Sacred land of chiefs

At Puʻuloa

The many channels

At Makapuʻu

Porpoises dance the hula

At Haleʻiwa

The taro patch

At Maunalua

Greet the elders

At Nu‘uanu

See the petroglyphs

This the refrain

About Honolulu

Source: This chant was composed for the Kamehameha Explorations program to commemorate the field trips experienced by the students. Verse 5, Pu‘uloa is the ancient name for Pearl Harbor. The channels refer to the locks. Verse 8, the elders are the residents of Lunalilo Home for aged Hawaiians.

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Appendix C. Public Engagement: Public Meetings and Scoping Meetings

Hawaii CZM Program

Coastal Zone Management

Office of Planning

Public Meeting for the National Estuarine Research Reserve System (NERRS) in Hawaii

Notice is hereby given that the Office of Planning, Hawaii Coastal Zone Management Program and the University of Hawaii with the support of the Estuarine Reserves Division of the Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), U. S. Department of Commerce, will hold a public meeting for the purpose of receiving comments on the preliminary recommendation that the Heeia estuary be proposed for designation as a National Estuarine Research Reserve in Hawaii.

The state agencies will hold a public meeting at 5:30 p.m. on January 9, 2014 at Governor Samuel Wilder King Intermediate School Dining Room, 46-155 Kamehameha Hwy, Kaneohe, HI 96744.

The views of interested persons and organizations on the proposed site recommendation are solicited, and may be expressed orally and/or in written statements. An informational presentation on the Heeia Estuary and the National Estuarine Research Reserve System (NERRS) is scheduled for 5:30 p.m. All comments received at the meeting will be considered in a formal nomination by the state to NOAA.

The National Estuarine Research Reserve System (NERRS) is a federal - state partnership network currently comprised of 28 reserves that represent different biogeographic regions of the United States and is administered by the National Oceanic and Atmospheric Administration (NOAA). These reserves are living laboratories established for long-term research, water quality monitoring, and education and coastal stewardship. Currently the Pacific region is not represented in the network, which means a site designated in Hawaii will add to the network's diversity and provide a new resource for researching coastal issues that are of concern in the Pacific. Established by the Coastal Zone Management Act of 1972, as amended, each reserve is managed by a lead state agency or university, with input from local partners. NOAA provides funding and national programmatic guidance.

The NERR site selection effort is a culmination of several years of local, grassroots support for a Hawaii NERR. The recommendation of the Heeia site follows a public solicitation and site proposal evaluation process. Federal, state, and county agency representatives, and estuarine experts acted as committee members who evaluated site proposals and decided on Heeia as the preferred site.

FOR FURTHER INFORMATION CONTACT:

Ms. Erica H. Seiden, Acting Chief, NOAA's Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, NOAA, 1305 East West Highway, N/ORM2, Silver Spring, MD 20910. Phone: 301-563-1172 Please e-mail comments to: **hawaii.nerr.comments@noaa.gov** by February 9, 2014.

Persons with disabilities please contact Leo Asuncion at the Office of Planning, Coastal Zone Management Program by December 31, 2013 to make arrangements. Phone: 808-587-2846

More information on the NERRS can be found at **http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process**.

report and appeal of denial to NMFS decisions, 4 hours each; application for transfer of IFQ between crab harvesting cooperatives, electronic, 5 minutes, non-electronic, 2 hours; application to Transfer Crab IPQ, electronic, 1 hour; non-electronic, 2 hours; CDQ notification of community representative, 5 hours; application for exemption from CR Crab North or South Region Delivery Requirements and North or South Region Delivery Exemption Report, 20 hours each.

Estimated Total Annual Burden Hours: 2,257.

Estimated Total Annual Cost to Public: $4,920 in recordkeeping/reporting costs.

IV. Request for Comments

Comments are invited on: (a) Whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden (including hours and cost) of the proposed collection of information; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques or other forms of information technology.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of this information collection; they also will become a matter of public record.

Dated: January 22, 2014.

Gwellnar Banks,

Management Analyst, Office of the Chief Information Officer.

[FR Doc. 2014–01482 Filed 1–27–14; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Public Meeting on the Proposed Heeia Site for a National Estuarine Research Reserve in Hawaii

AGENCY: The Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

ACTION: Public meeting notice.

SUMMARY: The Office of Planning, Hawaii Coastal Zone Management Program and the University of Hawaii with the support of the Estuarine Reserves Division of the Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, will hold a public meeting for the purpose of receiving comments on the preliminary recommendation that the Heeia estuary be proposed for designation as a National Estuarine Research Reserve in Hawaii.

DATES: The meeting will be held on February 27, 2014 at 5:30 p.m.

ADDRESSES: The meeting will be held at Governor Samuel Wilder King Intermediate School Dining Room, 46–155 Kamehameha Hwy, Kaneohe, HI 96744.

SUPPLEMENTARY INFORMATION: This will be the second public meeting held regarding the State's preliminary recommendation that the Heeia estuary in Kaneohe Bay, Oahu, be proposed for designation as a National Estuarine Research Reserve (NERR). A previous meeting was held on January 9, 2014. These meetings are held in compliance with NOAA regulations at 15 CFR Part 921 for the selection, designation and management of NERRs.

The views of interested persons and organizations on the proposed site recommendation are solicited, and may be expressed to the State of Hawaii orally during the meeting and/or in written statements to the Office of Planning, Coastal Zone Management Program, Attn: NERRS, P.O. Box 2359, Honolulu, HI 96804. An informational presentation on the Heeia Estuary and the National Estuarine Research Reserve System (NERRS) is scheduled for 5:30 p.m. All comments received at the meeting will be considered in a formal nomination by the state to NOAA. All comments provided to NOAA will be shared with the State of Hawaii as part of the site selection process.

The NERRS is a federal-state partnership that is administered by the National Oceanic and Atmospheric Administration (NOAA). The system protects more than 1.3 million acres of estuarine habitat for long-term research, monitoring, education and stewardship throughout the coastal United States. Established by the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451–1466 each reserve is managed by a lead state agency or university, with input from local partners. NOAA provides funding and national programmatic guidance.

The NERR site selection effort is a culmination of several years of local, grassroots support for a Hawaii NERR. The recommendation of the Heeia site follows a public solicitation and site proposal evaluation process. Federal, state, and county agency representatives and estuarine experts evaluated site proposals and recommended to the State that Heeia be considered as the preferred site.

FOR FURTHER INFORMATION CONTACT: Ms. Erica H. Seiden, Acting Chief, NOAA's Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, NOAA, 1305 East West Highway, N/ORM2, Silver Spring, MD 20910. Phone: 301–563–1172. Please email comments to: *hawaii.nerr.comments@noaa.gov* by March 7, 2014.

Persons with disabilities please contact Leo Asuncion at the Office of Planning, Coastal Zone Management Program by February 18, 2014 to make arrangements. Phone: 808–587–2846.

Dated: January 17, 2014.

Christopher C. Cartwright,

Associate Assistant Administrator for Management and CFO/CAO, Ocean Services and Coastal Zone Management.

[FR Doc. 2014–01578 Filed 1–27–14; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Submission for OMB Review; Comment Request

The United States Patent and Trademark Office (USPTO) will submit to the Office of Management and Budget (OMB) for clearance the following proposal for collection of information under the provisions of the Paperwork Reduction Act (44 U.S.C. chapter 35).

Agency: United States Patent and Trademark Office (USPTO).

Title: Native American Tribal Insignia Database.

Form Number(s): None.

Agency Approval Number: 0651–0048.

Type of Request: Extension of a currently approved collection.

Burden: 3 hours annually.

Number of Respondents: 3 responses per year.

Avg. Hours per Response: The USPTO estimates that a recognized Native American tribe will require an average of 45 minutes (0.75 hours) to complete a request to record an official insignia, including time to prepare the

Hawaii CZM Program

Coastal Zone Management

Office of Planning

Public Meeting for the National Estuarine Research Reserve System (NERRS) in Hawaii

Office of Planning

Notice is hereby given that the Office of Planning, Hawaii Coastal Zone Management Program and the University of Hawaii with the support of the Estuarine Reserves Division of the Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), U. S. Department of Commerce, will hold a public meeting for the purpose of receiving comments on the preliminary recommendation that the Heeia estuary be proposed for designation as a National Estuarine Research Reserve (NERR) in Hawaii.

The state agencies will hold a public meeting at 5:30 p.m. on February 27, 2014 at Governor Samuel Wilder King Intermediate School Dining Room, 46-155 Kamehameha Hwy, Kaneohe, HI 96744.

The views of interested persons and organizations on the proposed site recommendation are solicited, and may be expressed orally and/or in written statements. An informational presentation on the Heeia Estuary and the National Estuarine Research Reserve System is scheduled for 5:30 p.m. Comments received by February 9, 2014 will be addressed at the February 27, 2014 meeting. All comments received at the February 27, 2014 meeting and through March 7, 2014, in addition to those received earlier, will be considered in a formal nomination by the State to NOAA.

The National Estuarine Research Reserve System (NERRS) is a federal - state partnership network currently comprised of 28 reserves that represent different biogeographic regions of the United States and is administered by the (NOAA). These research reserves are living laboratories established for long-term research, water quality monitoring, and education and coastal stewardship. Currently the Pacific region is not represented in the network, which means a site designated in Hawaii will add to the network's diversity and provide a new resource for researching coastal issues that are of concern in the Pacific. Established by the Coastal Zone Management Act of 1972, as amended, each research reserve is managed by a lead state agency or university, with input from local partners. NOAA provides funding and national programmatic guidance.

The NERR site selection effort is a culmination of several years of local, grassroots support for a Hawaii NERR. The recommendation of the Heeia site follows a public solicitation and site proposal evaluation process. Federal, state, and county agency representatives, and estuarine experts acted as committee members who evaluated site proposals and decided on Heeia as the preferred site.

FOR FURTHER INFORMATION CONTACT:

Ms. Erica H. Seiden, Acting Chief, NOAA's Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, NOAA, 1305 East West Highway, N/ORM2, Silver Spring, MD 20910. Phone: 301-563-1172 Please e-mail comments to: **hawaii.nerr.comments@noaa.gov** by March 7, 2014.

Persons with disabilities please contact Leo Asuncion at the Office of Planning, Coastal Zone Management Program by February 18, 2014 to make arrangements. Phone: 808-587-2846

More information on the NERRS can be found at **http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process.**

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Public Meeting on Nominating Heeia as a NERR Site in Hawaii (1.9.14)

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Public Meeting on Nominating Heeia as a NERR Site in Hawaii (2.27.14)

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NEIL ABERCROMBIE
GOVERNOR

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C-17

Public Meeting on Nominating Heeia as a NERR Site in Hawaii (2.27.14)

Name (Organization)	Address	Email Address
Niki Miller	46-274 Ahui Nani Pl. Kaneohe	nikikaneohe@gmail.com
Vandeth Sek		vandeth.Sek@mail.house.gov
Charlie Reppun	47-410 Culani St.	
MIKE CHAFFIN	46-296 KAM Hwy	chaffinM001@hawaii.rr.com

Comments Received via E-mail

Commenting Individual/Organization	Email address	Date Received	Comment
Jeffrey Mullis	jeffreymullis@gmail.com	1/9/2014	I am a long time resident of Kaneohe and want to express my concern regarding designating Kaneohe Bay as a NERR site. Having grown up in Kaneohe, I am accustomed to being able to fish and spearfish in the bay as a way of life. I am very concerned that designating Kaneohe Bay as a NERR site will interfere with activities that have long been a part of our way of life in Hawaii. As a fisherman I care tremendously about the environment and understand the need to protect and care for it; however, I am not convinced that designating Kaneohe Bay as a NERR site is the best way to go about accomplishing this. I would like to offer my strong opposition to this proposal for your consideration.
Roy Sokolowski CIV COMPACFLT, N01CE1RS	roy.sokolowski@navy.mil	1/9/2014	Site selection criteria number 11 states that the site be "Minimally affected by humans (although diverted streams are acceptable)" this selection criteria makes Kaneohe Bay an unsuitable selection as a NERR's site. Kaneohe Bay is completely surrounded by human developments (housing, roads, a Marine Corps Air Station, extensive fishing, tourist and other human activities). Additionally because it is surrounded on land by human development the amount of non-point source pollution and run off from roads and state or county highways affect Kaneohe Bay much greater than the "minimally affected by humans" standard. Kaneohe Bay does not meet the stated requirements as a NERR's site and should be eliminated from further consideration.
Randy Iijima	riijima@hawaiiwater.com	1/9/2014	I am a third generation resident born and raised in Kaneohe and have been an active user of the bay and it's resources for over 40 years. I am very concerned the proposal to designate Kaneohe Bay as a NERR site will have a significant negative financial impact on the commercial activities as well as affect the life style and cultural practices of the residents that have been part of Kaneohe Bay for generations. As a fisherman I feel a personal connection to the bay and understand and believe there is a need to care for and protect this precious natural resource. I do not believe designating the bay as a NERR site will accomplish this. I strongly oppose the designation of Kaneohe Bay as a NERR site and ask that you consider all options (enforce existing rules and regulations) to maintain and preserve this resource.
Bryan Ikeda	brywenz@yahoo.com	1/9/2014	Site selection criteria number 11 states that the site be "Minimally affected by humans (although diverted streams are acceptable)" this selection criteria makes Kaneohe Bay an unsuitable selection as a NERR's site. Kaneohe Bay is completely surrounded by human developments (housing, roads, a Marine Corps Air Station, extensive fishing, tourist and other human activities). Additionally because it is surrounded on land by human development the amount of non-point source pollution and run off from roads and state or county highways affect Kaneohe Bay much greater than the "minimally affected by humans" standard. Kaneohe Bay does not meet the stated requirements as a NERR's site and should be eliminated from further consideration.I am very concerned that designating Kaneohe Bay as a NERR site will interfere with activities that have long been a part of our way of life in Hawaii. As a fisherman and diver, I care tremendously about the environment and understand the need to protect and care for it; however, I am not convinced that designating Kaneohe Bay as a NERR site is the best way to go about accomplishing this. I would like to offer my strong opposition to this proposal.
KEOLA HAYES	keolahayes@gmail.com	1/10/2014	I am a long time resident of Kaneohe and want to express my concern regarding designating Kaneohe Bay as a NERR site. Having grown up in Kaneohe, I am accustomed to being able to fish and spearfish in the bay as a way of life. I am very concerned that designating Kaneohe Bay as a NERR site will interfere with activities that have long been a part of our way of life in Hawaii. As a fisherman I care tremendously about the environment and understand the need to protect and care for it; however, I am not convinced that designating Kaneohe Bay as a NERR site is the best way to go about accomplishing this. I would like to offer my strong opposition to this proposal for your consideration. Site selection criteria number 11 states that the site be "Minimally affected by humans (although diverted streams are acceptable)" this selection criteria makes Kaneohe Bay an unsuitable selection as a NERR's site. Kaneohe Bay is completely surrounded by human developments (housing, roads, a Marine Corps Air Station, extensive fishing, tourist and other human activities). Additionally because it is surrounded on land by human development the amount of non-point source pollution and run off from roads and state or county highways affect Kaneohe Bay much greater than the "minimally affected by humans" standard. Kaneohe Bay does not meet the stated requirements as a NERR's site and should be eliminated from further consideration.
HCDA letter of support		1/10/2014	Attached.
Ron Tubbs, RT Distributors	rtubbs@hawaii.rr.com	1/13/2014	NERRS site for Kaneohe Bay can you provide me with more information on this. I missed last week's meeting. Will there be more meetings?

Larry Kunz	larson1930@hawaiiantel.net	2/4/2014	In regards to the NERR Heeia matter. First off I think it is a lousy idea. A total waste of tax payer's money. Where are the complaints about the area that needs to be studied? No study needed about the major problem in Kaneohe and Kailua if you ask anybody living near Heeia. It's the constant air craft noise from the Marine base. How will this boondoggle designation do anything about that? The key words in the notification letter I just received are very telling. "Permissible uses, managed uses, buffer area, monitoring, stewardship, management decisions" all reek of government controls. Ever increasing government controls are what is stifling our life style and freedom everywhere. I remember one of our former presidents saying, "If you hear anybody say, I'm from the government and I'm here to help you? Run for the hills"
Makani Christensen	makani.christensen@gmail.com	2/8/2014	My name is Makani Christensen. I'm a fisherman and a Guide. Are you closing the area between coconut island and the pond off from fishing? These are tako grounds and fly fishing grounds that a few users use.
Kelvin K.F. Ching	bnikelvin@gmail.com	2/10/2014	I oppose the NERRS designation in Heeia. Don't allow this to happen. You are asking for community input and we say no. No way. Adopt the Kaneohe Master Plan the way it is and honor the community who has worked so hard to create that plan. If everyone really wanted to do what's best, they'd be supporting the Master Plan in its entirety. If there is money to put toward the area, give it without the NERRS designation. By creating NERRS, you are further dividing the community instead of creating cohesion among us. Those in support of NERRS designation are willing to be bought, they're willing to sell their soul and do not realize the long term problems they are creating for the community as a whole. This is history repeating itself. The same way the Hawaiians were overthrown in the 1800s, it's happening all over again. Step back and take a look at how you are being used as sacrificial lambs for an ulterior motive. Wake up before it's too late.
Kelvin K.F. Ching	bnikelvin@gmail.com	2/10/2014	Submit your testimony today for it to be considered for Feb 27 meeting at King. If they get their foot in the door, imagine the precedence it sets for the rest of the bay and the rest of the state. Additionally, realize the "partners" include but not limited to Nature Conservancy, Conservation International and others. They divide and conquer families by using key community members for an agenda not really known to many. They approach key community members and propose millions of dollars for a cause and these members become blinded to the big picture and it's affects on the very community they think they are improving. If things are as transparent as some claim, why did you not hear about this from them? My testimony is below. I oppose the NERRS designation in Heeia. Don't allow this to happen. You are asking for community input and we say no. No way. Adopt the Kaneohe Master Plan the way it is and honor the community who has worked so hard to create that plan. If everyone really wanted to do what's best, they'd be supporting the Master Plan in its entirety. If there is money to put toward the area, give it without the NERRS designation. By creating NERRS, you are further dividing the community instead of creating cohesion among us. Those in support of NERRS designation are willing to be bought, they're willing to sell their soul and do not realize the long term problems they are creating for the community as a whole. This is history repeating itself. The same way the Hawaiians were overthrown, it's happening all over again. Step back and take a look at how you are being used as sacrificial lambs for an ulterior motive.
John Akima	omiluhunter@gmail.com	2/10/2014	I would like to express my concerns on this matter, first concerns is that the public will lose free access to the area regardless of what is being said. I am sure that a reserve would limit movement, and limit the amount of sea life taken among other things. Sure everyone states that nothing has been said about any restrictions, but what would a reserve be without some kind of restriction / monitoring? I am sure that we the general public will be allowed to transit through the reserve however stopping will probably be prohibited without written approval and the same as taking sea life would most likely be by permit only. Once again this both will require prior approval and more than likely a cost which all proceeds going to the "reserve". Once approval has been given as a NEERS then all gloves will come off and it will become a government and their partnership directed program with the appearance that public meetings will be held to solicit ideas if it meets what the "partnerships" have in mind. I completely understand that the "partnership" are 100 % sold on the idea! why wouldn't they be , they will be getting "federal funding for their programs" which in turns puts money in their pockets at the end of the day no matter how you slice it. Of course this ensures longevity in their programs and retirement! I am completely against this designation as it will only take away from our history, culture and way of life.

Ben Wong	letsgofishinghawaii@gmail.com	2/7/2014	es·tu·ar·y [es-choo-er-ee] Show IPA noun, plural es·tu·ar·ies. 1. that part of the mouth or lower course of a river in which the river's current meets the sea's tide. 2. an arm or inlet of the sea at the lower end of a river. (Dictionary.com) es·tu·ary : an area where a river flows into the sea : a water passage where the tide meets a river current; especially : an arm of the sea at the lower end of a river (Merriam – Webster) February 7, 2014 To whom it may concern: I attended the King Intermediate public meeting with optimism. With the word “estuary” being paired with the word “restoration”, well, the thought that clean freshwater from our mountains could once again reach our bay is certainly what many Kaneohe Bay resource users would support.Kaneohe Bay marine life, to include opae, o’opu, ama’ama, and Samoan crab would thrive in healthy estuary ecosystems. Unfortunately, the rain runoff containing acidic red dirt and automobile pollutants from our streets has replaced what used to be clean rainwater from the Koolaus. After the public meeting, many of the concerns of the attendees became mine. Little of what was discussed suggested improvement for the resource users of Kaneohe Bay. But my main concern is this: In an effort to justify another management system (Heeia NERRS) and the monies that would come with it, many testified to Kaneohe Bay as being “dead” and “dying”. In the 1960s, the bay received treated effluent from the Aikahi sewage plant. The e coli levels in the bay were unhealthy for humans, but the bay was nutrient rich for marine life. We had opae in abundance living in the green limu. Schools of omaka, awa awa, sardines, and popaa traveled under dense layers of jellyfish. Morning schools of nehu and halulu breaking the surface of the bay were common.
Ben Wong CONT'D			By the 1970s the sewage outfall was redirected to the ocean outside of Mokapu. The bay’s ecosystem went into shock. With the water quality change the limu disappeared, along with the opae, the schools of nehu, omaka, halulu, etc… I do not advocate returning the bay to high levels of e coli, but this period, the 1970s to the 1980s, show that resource users dealt with changes to the bay’s environment. Over those decades we heard and read about coral bleaching come and go. We heard and read about invasive coral sponge come and go. The health of our Kbay coral has been a source of hand wringing for many. But did you know, that the coral reef around Coconut Island grew so aggressively, that as a result, coral heads were sealing navigation channels facilitating the island. In the early 2000s, since dredging had become illegal, the navy divers from the marine base engaged in “coral transplanting” by breaking the coral off to widen and deepen the channels and placing the pieces in the middle of the bay.
Ben Wong CONT'D			Also at about this timeline, the late 1990s, I would drop one piece of net or 45 minutes just before nautical sunset. Up to 50 pieces including moi, papio, mullet, oio, lae, akule, omaka, weke, kumu, uhu, palani, would get caught in my 3-inch eye net with a length of 125 feet. I haven’t engaged in this activity since then, but by the end of the 1990s, the fishery had bounced back strongly. So those who continue to say the bay is hurting, are they repeating what someone else has said or are they truly witness to a decline I’ve missed seeing.
Ben Wong CONT'D			The frustrations and distrust by those in attendance come from many variables. Many in attendance have been Kaneohe residents for generations and are concerned and suspicious of how their interests may be sacrificed by others. 1. The lack of enforcement of current netting regulations. 2. The discourteous confrontations by Marine Base patrol. 3. The increase in size of Marine Base restricted areas. 4. The Marine Base restricted areas continue to be unmarked. 5. Reckless drivers of Marine Base boat rentals. Add to this list the newly proposed sanctuary, and you can see how some are worried that their concerns will be thrown under the bus by those who would benefit from the monies that would come with Federal Approval for a NERRS. Very disconcerting to those at the meeting was the proposed map of the estuary sanctuary, which seems to include much area of the bay far from where freshwater meets the sea. Thank you for this opportunity to give testimony. PDF attached.

Bradd Haitsuka	bonefishless@gmail.com	2/12/2014	I am writing to voice my strong opposition to having a NERR set-up in my back yard. As stated in your literature fora site to be considered as a NERR site : Site selection criteria number 11 states that the site be "Minimally affected by humans (although diverted streams are acceptable)" this selection criteria makes Kaneohe Bay an unsuitable selection as a NERR's site. Kaneohe Bay is completely surrounded by human developments (housing, roads, a Marine Corps Air Station, extensive fishing, tourist and other human activities). Additionally because it is surrounded on land by human development the amount of non-point source pollution and run off from roads and state or county highways affect Kaneohe Bay much greater than the "minimally affected by humans" standard. Kaneohe Bay does not meet the stated requirements as a NERR's site and should be eliminated from further consideration.
Billy Chang	bcsc@hawaii.rr.com	2/12/2014	I oppose the NERRS designation in Heeia. Do not allow this to happen. You are asking for community input and I say no. Adopt the Kaneohe Master Plan the way it is and honor the community who has worked so hard to create that plan. If everyone really wanted to do what's best, they'd be supporting the Master Plan in its entirety. If there is money to put toward the area, give it without the NERRS designation. By creating NERRS, you will further dividing the community instead of creating cohesion and end up pittiing the various stakeholders against each other. Those in support of NERRS designation do not realize the long term problems they will be creating for the community.
Dan Rubinoff	rubinoff@hawaii.edu	2/14/2014	I am writing in strong support of the establishment of an NERR for Kaneohe Bay. While there are private fishing interests who oppose any restrictions on fishing anywhere in the state, it has been repeatedly demonstrated around the world that reserves actually enhance the fishing resources adjacent to the reserves. It's unfortunate that a few short-sighted interest groups oppose a longer term opportunity to understand and protect our marine resources. Further, the current proposal doesn't even ban fishing! So the opposition here seems to be preemptive and reactionary. We know the fisheries are not doing well and that research is needed to make them sustainable. This NERR will be a first important step and is in an ideal location for sound and effective research to take place. There really couldn't be a better situation. If, down the line, fishing restrictions are considered, then the fishing interests will have a chance to speak their minds, but right now they are simply opposing a sound research infrastructure from which we will ALL benefit.
Susan Carstenn	environalo@gmail.com	2/15/2014	I strongly support He`eia estuaries nomination as a NERR. I have been working in the He`eia watershed for over 10 years and this designation will add to the on going efforts of the entire community to understand the interactions of humans and nature. Doug Harper's efforts, on behalf of the NOAA Sentinel Site designation, to bring the community together will be enhanced. This is an exciting time.
Megan Donahue	megan.j.donahue@gmail.com	2/15/2014	I am writing in support of the He'eia NERR designation. Kane'ohe Bay is an amazing success story. Throughout the 70s and 80s, He'eia and other communities around Kaneohe Bay fought development plans to keep Kane'ohe from turning into Hawaii Kai. The sewage outfall that once entered the south bay, causing extreme eutrophication and algal blooms, was diverted and coral cover increased throughout the Bay. The mangrove that invaded the coastline, starting from He'eia in the early 1900s, is being slowly removed from He'eia fishpond. And while many problems remain, including invasive limu and overfishing, the He'eia community has come together in an active plan to restore the ahupua'a. The NERR designation will provide funding to monitor the continued improvement of Kane'ohe Bay: how Kaneohe Bay reefs respond to the restored lo'i and loko i'a, as well as response to climate change. Perhaps we can better understand how restoration mauka will change the reefs makai, and this understanding can help restoration efforts throughout Hawai'i. The NERR designation will not impact fishing or recreational use of Kane'ohe Bay. Indeed, NERR designation is toothless in this regard. But it will allow us to better understand how Kane'ohe Bay reefs are changing through time and give us metrics to improve our management.
John M. Sandor	sandball@aol.com	2/16/2014	I am in favor of moving forward with any project to help improve the water quality of Kaneohe Bay. It always makes me sad to see the southern bay turn brown after heavy rains. There has to be better way to trap sediments before they get discharged to muddy the bay waters. I suppose that natural wetlands used to do that job, but since the coastline has been developed those no longer exist. A solution is out there, it just needs to be found and implemented.

Koolaupoko Civic Club letter of support		2/19/2014	KO'OLAUPOKO HAWAIIAN CIVIC CLUB NERRS DESIGNATION Re: Designation of He' eia Ahupua' a/Estuary as a NERRS Site Aloha, Ms. Arbin: On behalf of the Ko' olaupoko Hawaiian Civic Club, I wish to add our voice of strong support for the designation ofHe'eia estuary as a federal National Estuarine Research Reserve System site. The Ko' olaupoko Hawaiian Civic Club is the second largest of all 68 Hawaiian Civic Clubs nationwide. Most of our members live and work in the Kane' ohe Bay region, which includes the important ahupua' a (land division) ofHe'eia. We are deeply concerned about the environmental health and sustainability of this ecosystem to survive and thrive in generations to come. What is unique about this estuary, however, is that there are still sufficient natural resources that can be restored or rehabilitated to become more sustainable, whether for food or water production. We are also looking at the long-term health of the bay itself, which once thrived with ample schools of fish but which has endured a variety of environmental challenges over the past two decades. Our organization believes that He' eia offers the NERRS program an excellent opportunity to fulfill its mission, which is to bring science and communities together to solve our coastal problems. We would like to see, through the work product ofNERRS, identification of the environmental problems and their causes that the area is facing; and a work plan of actions needed to address those problems to enhance a healthy sustainability for this estuary. We urge the State ofHawai'i to continue its efforts to promote He'eia estuary for designation by the Federal government as a NERRS site in the Pacific region. If you have any questions or concerns, please contact us at (808) 23 5-8111. Me kealoha pumehana, ~~~ ALICEP. HEWETT President cc: Governor Abercrombie

Koolau Foundation letter of support		2/19/2014	Subject: NERRS Designation of He' eia Estuary - Support Dear Ms. Arbin: The Ko 'olau Foundation offers its full support for the designation of He' eia estuary as one of the federal National Estuary Research Reserve System sites for the Pacific area. Our Foundation, which works closely with the communities in and around He' eia and Kane' ohe Bay, has been engaged for years in planning for establishment of a cultural preserve in the upland areas of this region. Waters flowing from Ha 'iku Valley find their way to the estuary and the bay itself. We believe that NERRS will help identify environmental challenges this area faces, including any that may have come from the lands we are hoping to restore upslope from the estuary. Armed with the knowledge that can be gained from a NERRS designation, our community can find ways to address these problems and seek solutions. We urge Governor Abercrombie and the Office of Planning to proceed post-haste to seek federal designation of He' eia estuary as the NERRS site for Hawai 'i. Mahalo for this opportunity to share our thoughts regarding this important undertaking. Sincerely, ~.~ MAHEALANI CYPHER Secretary to the Board of Directors, Koolau Foundation
Angel England	a.england@comties.com	2/18/2014	I am writing to support Kaneohe Bay becoming a NERRS site. As a resident of Kaneohe Bay I am interested in finding out how we can clean up the bay. Researching the issues is the only way to find out what is occurring to we can discover ways to improve our water quality, fish and coral habitats for fisherman, snorkelers, divers, boaters and all habitants of the ocean and for our future generations. Many coastal areas are becoming “dead” zones where the water cannot support or sustain life. It would be a shame if Kaneohe Bay became a “dead zone”.
Heather Ylitalo-Ward	hylitalo@gmail.com	2/18/2014	Hello, I am writing to provide my support of designating Kaneohe Bay as a NERRS site. I think Kaneohe Bay would greatly benefit form this designation. Thank you for your time
Visakha Gibbons	gabbard1@capitol.hawaii.gov	2/18/2014	I hope you’re well. Mahalo for inviting Senator Mike Gabbard to the public meeting on Feb 27. Sorry, he won’t be able to attend due to prior engagements. Thank you very much,
Brian Bowen	bbowen@hawaii.edu	2/19/2014	I am writing to register my wholehearted support for the NERRS site in Kaneohe Bay. As a research scientist at HIMB, I know that Kaneohe Bay is among the best characterized coral reef habitats in the world. Dozens of M.S. and Ph.D. projects have been done there, which provides a tremendous scientific foundation for assessing future changes. Further, Kaneohe Bay is the only lagoon habitat that is readily accessible in Hawaii. By proxy, that makes it the only NERRS site in the U.S.A. with the features of an estuary, a lagoon, and a coral reef ecosystem. Finally, Kaneohe Bay is the focus of intense public interest and tourism, which makes it a great place to inform our citizens and visitors about conservation issues. Thanks you for creating a forum to discuss this possibility.
Sharon Lowrie	coconutkai@hotmail.com	2/19/2014	I live on the Bay and watch brown water flood into it to smother the reefs fter hevy rains. We used to have clams and edible oysters but humans have caused. disaster to the by with thwir building sites. i do hope you can help to clen up thw by. thank you.

Amy Moran	morana@hawaii.edu	2/22/2014	For many years I lived in Oregon near a new NERRS site. The NERRS there had very good interactions with the local community. It brought nothing but good to the natural ecosystem and fisheries. I am very much in favor of the Heeia NERRS site.
Ricardo Zanre	rzanre@yahoo.co.uk	2/24/2014	I'm a resident of He'eia and am familiar with the great work being done by grassroots community groups, such as Paepae o He'eia and Kako'o 'Oiwi, to restore coastal ecosystems and their function, improving stewardship of local natural resources for the benefit of local communities. I support these community groups' desire for NERR site designation as it will improve collaboration between them and Government agencies, providing the necessary resources to properly research and understand the issues that are negatively affecting the coastal ecosystem of He'eia and Kaneohe Bay, helping to improve decision making for the management of natural resources that the local community all depend upon. The associated support that NERR also provides for educational programs will help us all to better understand the issues affecting Kaneohe Bay and enable us to adjust our behaviors accordingly to improve the health of the Bay.
Angela Kawelo	hkawelo@hotmail.com	2/25/2014	Aloha, Please find attached my testimony for the designated He'eia NERR site. I am in support of the designation. Hi'ilei Kawelo
Kristina Jenkins	kjenkins@tnc.org	2/25/2014	The Nature Conservancy (TNC) strongly supports the designation of He'eia, O'ahu as a National Estuarine Research Reserve (NERR). If selected as a NERR, He'eia will provide an ideal site for culturally-relevant research and education. The NERR designation will also provide a way to strengthen the community's role in managing Kāne'ohe Bay and the surrounding watershed. TNC has two long-term projects underway in Kāne'ohe Bay, in partnership with state and community organizations. We are removing invasive algae with the State of Hawai'i Division of Aquatic Resources (DAR) and assessing its effects on fish and corals. We are also monitoring water quality in the He'eia ahupua'a with local non-profit organization Kāko'o 'Oiwi to determine the effects of their community-based efforts to restore over 400 acres of wetlands. We anticipate that our current and future projects in He'eia will contribute to NERR research and educational programs, and that TNC will be an on-going active partner in the He'eia NERR. NERR designation does not include the closure of the bay to fishing or other recreational or commercial uses. Rather, the purpose of the NERR is research and education. It will be a place to teach and learn about marine science, traditional ecological knowledge, and what makes the bay such a special place. What we learn in the NERR can inform community efforts to manage the bay sustainably by providing information about the health of the bay, what is affecting it, and how it is changing over time. On-going community engagement is essential for good stewardship of the bay, and critical to the success of the He'eia NERR. Thank you for the opportunity to support the designation of He'eia as a National Estuarine Research Reserve. Suzanne D. Case Executive Director

Jade M. S. Delevaux	jade.delevaux@gmail.com	2/26/2014	To whom it may concern, I am would like to submit a testimony in favor of the NERRS designation site in Kaneohe. I am a PhD student in the department of Natural Resources and Environmental Management at the University of Hawai`i. From an ecological standpoint, reviving Ahupua`a management requires restoring mauka and makai simultaneously given the underlying connectivity of the system as whole. From a social standpoint, reviving Ahupua`a is also an opportunity to enhance Native Hawaiian wellbeing. This designation can further support social and ecological health, through strengthening already ongoing efforts in the area, restoring, and caring for the Aina, while enhancing collaborative management. This is an opportunity to deepened existing community effort, existing partnerships between communities and scientists, and now there is a window to involve managers in a more cohesive manner. Please find this electronic testimony as proof of my support for the NERRS designation. Do not hesitate to contact me if you need further information Mahalo Jade M. S. Delevaux Graduate Research Asssitant, UH Manoa
Jason Philibotte, Conservation International	jphilibotte@conservation.org	2/26/2014	To whom it may concern, Conservation International's Hawai'i Fish Trust program has invested more than $1.8 million in projects supporting ho'i i ke kai momona--- a return to an abundant ocean--- across Hawai'i. Our projects and partners in and around He'eia have demonstrated the area's importance and we are pleased to provide this letter of support. A National Estuarine Research Reserve (NERR) would provide an opportunity for both short and long---term research and education, as well as improved ahupua'a management. We understand that the NERR designation does not include the closure of the bay to fishing or other recreational or commercial uses; it is consistent with our goal of securing our future of sustainable fish. It will be a place to teach and learn about marine science, traditional ecological knowledge, and what makes the bay such a special place. The Hawai'i Fish Trust strongly supports the designation of He'eia, O'ahu as a NERR. If selected, He'eia will provide an ideal site for culturally---relevant research and education, helping management agencies and leading to better resource management. The NERR designation will also provide a way to strengthen the community's role in managing Kāne'ohe Bay and the surrounding watershed. On---going community engagement is essential for good stewardship of the bay, and critical to the success of the He'eia NERR. Thank you for the opportunity to support the designation of He'eia as a National Estuarine Research Reserve.

Rafael Bergstrom	rafberg81@gmail.com	2/26/2014	I would like to voice my strong support for the designation of a National Estuarine Research Reserve in Kane'ohe Bay. Our rapidly increasing human impact on our valuable and vulnerable near-shore ecosystems is highly apparent and creating a reserve which protects and creates baseline studies for efforts at restoration will be a vital tool for a healthy marine ecosystem into the future. I am a recent graduate of the Master's program in the Department of Natural Resources at UH Manoa and have begun working for the Surfrider Foundation which has a distinct focus in coastal zone management, water quality, and community engagement. Additionally, I have spent time working and volunteering in the Ko'olaupoko Moku with organizations like Paepae O He'eia and Papahana Kuaola through my involvement with the Hawaiian Youth Conservation Corps. As these organizations continue their restoration efforts mauka to makai and organizations like Hui O Ko'olaupoko empower our communities to work towards residential sustainability, it will be of great importance to have monitoring systems in place to measure the impacts of upland work on the health of the bay. Given the diverse group of community organizations who support this designation as well as the research focus of HIMB, the area seems an ideal fit for the overarching goals of NERRS. This team of community stewards is the embodiment of a system in which environmental protection, education, and awareness are fostered from the ground up while being supported through a national program. Before coming to Hawai'i I called California my home and was fortunate enough to volunteer for the Elkhorn Slough Foundation, the caretakers of the Elkhorn Slough National Estuarine Research Reserve on the central California coast. This was some of my first exposure to the environmental management field and I got to see in action how NERRS was working to engage a wide variety of stakeholders in its efforts to maintain, restore, and protect a fascinatingly unique ecosystem vital to the migrations of the Pacific Flyway. The opportunities for education to all ages as well as the recreational possibilities through an extensive trail system were very impressive. Hawai'i has the appeal of filling a gap in tropical NERRS as well illuminating the impacts that rapid growth has had on the island of Oahu. I appreciate the opportunity to voice my opinion on this matter and hope that your attention is always turned to community engagement. The concerns of those in opposition to such a system must also be heard and I firmly believe that the organizations discussed above, as well as others who support the NERRS designation will actively work to make this an equitable solution for all involved. Thank you for your time, Rafael Bergstrom

Pua‘ala Pascua	puaalaikahoni@gmail.com	2/26/2014	To whom it may concern, Aloha. My name is Pua‘ala Pascua, and I’m a graduate student in the University of Hawai’i at Mānoa, Department of Natural Resources and Environmental Management. I write this testimony today, not only as an academic researcher, but also as a Native Hawaiian lineal descendent of He‘eia with multigenerational ties to the Ko‘amokumoku, the fragmented reef of Kāne’ohe Bay. Although my parents moved my immediate family away from Kāne‘ohe and into town when I was 10 years old, He‘eia is my kulāiwi. Generations upon generations of my kūpuna cared for and relied upon the abundant natural resources of the area, and when it was their time to go, their bones were placed into the earth and they became the soil that allowed these resources to thrive. Thus caring for these natural resources IS caring for kūpuna. In my personal opinion, Native Hawaiian stewardship practices of both terrestrial and marine resources are heavily dependent upon critical observation and real time monitoring of ecosystem health. In traditional times we had kia manu, bird catchers who knew the seasonal molting patterns of select native birds so that their harvest of feathers would not impact the natural bird population. We also had kilo i‘a, fishery observers who knew the seasonal spawning and fish migration patterns so that catch would minimally impact fish abundance. Hawai’i has transformed drastically since then, and the decline of specialized positions like these strongly correlate with the declining health of our environment. This He‘eia NERR designation provides the State of Hawai’i, the non-profit mālama ‘āina groups of He‘eia, and all He‘eia community members with critical resources to be able to do just that, monitor the health of our environment in real time, then make management decisions based off of those observations. This is not at all a new idea, we’ve just lost this practice a little along the way. Although the degradation of our estuarine environment can be attributed to a number of both land-based and marine-based stressors, the first step to remediation is to understand the environmental processes that are occurring right now, then identifying an equitable way to address those concerns. This NERR proposal was compiled by some of the most resourceful, connected, and capable representatives from stewardship, researcher, and Native Hawaiian stakeholder groups in He‘eia. Under their guidance and leadership, I’m sure this project with definitely thrive. With that said, I do think one concern I have regarding this designation, is to ensure their participation and representation for the duration of the NERR project. The NERR website mentions that particular consideration will go into the preservation and integrity of landscape-scale ecosystems, however I do hope that at the He‘eia NERR site, special consideration will be given to bio-cultural research that enables communities and non-profits as participants in the process. I know that much of this consideration will be addressed in subsequent planning periods but an initial statement on commitment early on, would really help clarify these issues so that more individuals can get behind this project. Overall I think
Pua‘ala Pascua (CONT'D)			it’s a great thing for He‘eia, and in the right hands, this research will really advance not only our estuarine health, but our ecosystem health, and ideally our Native Hawaiian health too. Mahalo nui for your time and consideration, Pua’ala Pascua
Raymond Sanborn, President, Kama’aina Kids; Andy Carre, Park Manager, He’eia State Park	andy@heeiastatepark.org	2/27/2014	See attached letter.

Lauren Esaki	lesaki@hawaii.edu	2/27/2014	To whom it may concern, I am voicing my support for the establishment of a National Estuarine Research Reserve System in Kāneʻohe. Although I am not from the area (originally from Kauaʻi), I think that any NERRS designation in Hawaiʻi would be beneficial to the collective efforts of those seeking to better understand and mālama our ʻāina. From my understanding, an NERRS designation does not and will not affect the current recreational or commercial activities occurring in Kāneʻohe Bay. The designation will simply allocate more resources to both learn about and educate the public about our aquatic resources. Our current understandings of our estuaries are limited in Hawaiʻi, and place specific knowledge is especially key to better managing and understanding our roles within the ecosystems in which we live in, recreate in, and perpetuate culture in. Specifically in Kāneʻohe, excellent collaborative efforts within the fields of natural resource management and Hawaiian cultural practices are already well established with Kakoʻo ʻOiwi and Paepae o Heʻeia. NERRS would help to further elevate and build upon the expertise of existing organizations and individuals, and form an even more cohesive body of researchers and educators, equipped with the proper resources to learn about and protect an important area of Oʻahu. I hope that this opportunity is awarded to Kāneʻohe for a more sustainable future.
Sam Monet	monets001@hawaii.rr.com	2/27/2014	National Oceanic and Atmospheric Administration Public Meeting on the Proposed Heeia Site for a National Estuarine Research Reserve in Hawaii please identify and provide a map or chart of the proposed sanitary thanks
Nancy Davlantes	ndavlantes@aol.com	2/27/2014	Aloha -- Please add my name to those who support the designation of Heʻeia, Oʻahu as a National Estuarine Research Reserve. If selected as a NERR, Heʻeia would provide an ideal site for culturally-relevant research and education. The designation would also provide a way to strengthen the community's role in managing Kāneʻohe Bay and the surrounding watershed. What is learned in the NERR can inform community efforts to manage the bay sustainably by providing information about its health, what is affecting it, and how it is changing over time. On-going community engagement is essential for good stewardship of the bay, and critical to the success of the Heʻeia NERR. Mahalo for the opportunity to support the designation of Heʻeia as a National Estuarine Research Reserve.

Lea Hong Hawaiian Islands State Director The Trust for Public Land	Lea.Hong@tpl.org	2/27/2014	Aloha - The Trust for Public Land's Hawaiian Islands Field Office supports the designation of Hei'eia, O'ahu as a National Estuarine Research Reserve or NERR. NERRS constitute a national network of 28 areas that have been established for long-term research, water quality monitoring, education and coastal stewardship. Designation of He'eia as a NERR will enable more research, allow for additional educational programming and outreach, increase our understanding of the impacts of climate change, and provide opportunities for funding to support research infrastructure and educational field trips. So long as the designation will not decrease recreational and traditional and customary access to the shoreline and bay, The Trust for Public Land supports the proposed NERR designation. Mahalo - Lea
Jill Zamzow	jzamzow@gmail.com	2/27/2014	Aloha, I would like to express my support for the designation of He'eia, Oahu as a NERR. Kaneohe Bay, and He'eia in particular, are very special places. I live in He'eia watershed, and do my fair share of outreach in my official capacity, however, these comments should be taken from me speaking as a citizen, and resident, of He'eia, Oahu, and not in any sense be taken to reflect the feelings of the Coral Reef Ecosystem Division, the Pacific Islands Fishery Science Center, nor the National Marine Fisheries Service. I moved to Hawaii in 1995, and was a student at Moku o Lo'e, Coconut Island, for 8 years while I completed my Masters and PhD at the University of Hawaii. I owned a 25' sailboat moored offshore of He'eia for many years, and she is still in He'eia Harbor to this day. I have kayaked, paddled, swam, dove, snorkeled, reef-walked, power boated, jet ski-ed, sailed, windsurfed, SUP-ed, pulled alien limu, picked up plastic, cans, fishing leads, broken glass,, and pretty much anything else you can think of, in and around He'eia Kea Pier, and across the bay and around O'ahu, the main Hawaiian Islands, and beyond. I am a reef fish researcher, and I see first hand the detrimental effects to the reefs and fishes that are caused by insults such as trash, poor water quality, lay net fishing, other non-pono fishing practices. I analyze data for the Division of Aquatic Resources, so that they can try to change some of these problems by getting new legislative rules passed. My husband is a professor at the Hawaii Institute of Marine Biology, so I still get out to Coconut Island now and then, and it is heartening to see the slow changes there, away from heaps of trash, and toward sustainability. Nearly every day, I see evidence of the good that TNC Hawaii is doing, particularly with respect to education, communication and community involvement. I would therefore urge you to seriously consider the He'eia watershed as a National Estuarine Research Reserve, for it would be a valuable addition to your program, and one that is sure to pay off for the community. Cheers,

Jennifer Manuel	jennifer.manuel@lejardinacademy.org	2/27/2014	Aloha, My fourth graders at Le Jardin Academy in Kailua, HI, wanted to express several reasons why they think that we should make a difference in ocean conservation. My students are hoping that scientists and researchers can pull invasive species and hold fishing for the following reasons: 1. We (fourth graders) want to be able to enjoy this amazing and sacred place for our future generations. 2. It will be safer for scientists and researchers to pull invasive species without fishing going on at the same time. 3. If people don't do something about the invasive species, there will be an overpopulation of invasive species. 4. We (fourth graders) want to protect endangered species in the ocean ecosystem. 5. We have a personal connection with He'eia Fishponds and want to preserve the ocean and reef around it. I hope this information helps in the board meeting tonight. My students are passionate about their ahu'pua'a and want to voice their opinions! Mahalo.
Kapua Kawelo and Joby Rohrer	jobykapua@hawaiiantel.net	2/28/2014	Aloha, Please accept my written testimony. I also testified last night at the hearing in person but this is more comprehensive. Also John Reppun from the KEY project in Waihee Valley suggested that any NERR announcments could be posted on their community bulletin board there. I will forward the email from him if you are interested in sending him any info as the process moves forward. Mahalo, Kapua Kawelo To Whom It May Concern: I am a Koʻolaupoko community member and resident and I strongly support the NERR designation for the Heeia Watershed including the near shore reef areas in that Ahupuaʻa. I commend the many community groups who are stakeholders in this proposal and who continue to conduct community restoration and education in their various ways to the benefit of Koolaupoko! This NERR designation will bring more recognition and support to these grass roots efforts. This NERR designation is an opportunity for us to completely restore an ahupua'a on O'ahu, the most heavily populated of our islands. It can serve as a living laboratory, helping us to answer the difficult questions about what is causing the decline in our resources. It is likely a combination of many problems including, alien species, erosion, pollution and, yes, overfishing and unsustainable fishing practices. This designation may finally provide the place where the relative importance of each contributing factor can be investigated and used to guide future rules and regulations related to these topics. Let's face it, Kaneohe Bay is a troubled natural resource. The days of burgeoning hukilau nets and boilling schools of fish are no longer. In the olden days, a Konohiki had overarching authority to close various fisheries in order to preserve the resources for future generations and to sustain the community. Today, unfortunately, this system is broken. The DLNR who sets fishing regulations is too lax, often succumbing to the political pressures of particular stakeholders. None of the users of the bay want to hand down a fish graveyard to our keiki and have them ask why we did not make some sacrifices for the future while there was still time. If designated, hopefully, the research conducted within the He'eia Ahupua'a will help guide our practices and decisions in order to preserve our precious Kaneohe Bay for future generations. Just as my Tutu Kane taught his children about the importance of using our natural resources respectfully, so do I teach my children the same. If this designation proceeds, I look forward to participating in the development of a management plan for the area. I feel I can offer many specific suggestions about this ahupuaʻa and look forward to the opportunity contribute to this planning process.

Kapua Kawelo and Joby Rohrer (CONT'D)			Aloha, Kapua Kawelo 47-533 Melekula Rd. Kaneohe, HI 96744
Kapua Kawelo and Joby Rohrer	jobykapua@hawaiiantel.net	2/28/2014	As promised a suggestion that meeting announcements could be posted regarding the NERR at the KEY project in Waihee if you are interested.
Jobriath Rohrer	jobyrohrer@gmail.com	2/28/2014	To whom it may concern: I am writing in support of the NERR designation. I wholeheartedly support the Heeia community groups that the are proponents of this project. Their efforts and intentions are exactly what is needed in Heeia and across all Hawaii's watersheds; restoration of the resources, education of the community and development of sustainable local food networks. I hope that this designation will bring more resources to these important efforts. I have lived in Kahaluu for 15 year and Hawaii almost my life. I am very proud that my family eats fish from the windward side, grows vegetables in our garden and eats fruit from our family's trees. I want to continue to live from the resource within our community and want to understand, support and participate in sustaining our land and sea for generations to come. Sincerely, Joby Rohrer
Ron Weidenbach	hawaiifish@gmail.com	3/2/2014	I sent in comments this afternoon regarding my support for adding He' eia, Hawaii to the NERRS, with a Cc to myself, and never received my Cc so am wondering if the link provided for such testimony failed. Please advise whterh or nor you received my testimony. Thank you, Ron Weidenbach
Ron Weidenbach	hawaiifish@gmail.com	3/4/2014	Aloha, My name is Ronald P. Weidenbach and I am emailing in support of the designation of He' eia, Oahu as an addition to the NERRP. This my second attempt to try and submit testimony in support of adding He' eia, Oahu to the NERRP. I was a member of the original University of Miami, Rosentiel School of Marine and Atmospheric Sciences, Rookery Bay research team, Naples, Florida, led by Bernard Yokel, Ph.D., and funded by the National Audubon Society, the Nature Conservancy, and the Collier County Conservancy, that conducted the extensive base-line research efforts leading to the preservation of this prime example of a Florida mangrove estuarine resource, and the establishment of the National Estuarine Research Reserve Program (NERRP). I am also a member of the University of Hawaii Sea Grant Advisory Board that has supported the funding of multiple research efforts on He' eia, Oahu. Although the two ecosystems are vastly different, the He' eia site is a prime and well preserved example of how ancient Hawaiians sustainably managed estuarine environments to support the food production needs of their society, and offers numerous research opportunities that could provide valuable lessons to modern-day society as we seek to become more sustainable in our coastal food production efforts while also conserving our valuable coastal resources. Given this important research opportunity, I hope that NOAA will favorably consider designation of He- eia, Oahu into the NERRS. Thank you for the opportunity to testify.
Raymond Joao	rjoao@hawaii.rr.com	3/5/2014	Heeia area encompasses so many qualities of the classic Ahapua'a model that we cannot afford to allow this asset to go unprotected. Raymond Joao

Kamakani Dancil	kadancil@ksbe.edu	3/5/2014	Aloha, Please find our questions/comments below: 1. Will there be any changes to the boundaries of the proposed NERR site? 2. How and by whom will the research be implemented? 3. What will be considered public information of the research findings? 4. What are the implications, as a result of the NERRS Designation, for management or regulations as it affects private lands? 5. How and by whom will access be managed to private lands? 6. In general, KS is supportive of the NERRS designation. Mahalo, kama
Jacqueline Baker	jacqueline.s.baker@gmail.com or Bakerjs@hawaii.edu		My name is Jacqueline Baker. I am a law student at William S. Richardson School of Law in Hawaii and I'm interested in this matter because I'm attending law school specifically to get involved in ocean and coastal conservation efforts. I am not local to Hawaii and I do not have any connection to the Heeia area community but I still care about the preservation of unique aquatic environments that are in trouble. Therefore, I support the proposal to list this area as a NERR estuary. I am primarily in support of this designation because it is clearly a community effort and would place the estuary in a situation where the local community will be the primary governing body, but with the added benefit of access to federal resources. As I understand, NERR's primary role will be to simply provide the local area with the tools and knowledge to better combat the problems facing the Heeia estuary. The second reason why I support this designation is because I believe it could lead to the discovery of valuable scientific information. NERR has estuaries all over the country but Heeia would be the first estuary in Pacific waters. Designation of Heeia as a NERR estuary will allow for scientific observation of a new type of habitat. Heeia will differ from any other type of estuary and by engaging in the kind of scientific study that will be part of the NERR designation, the local community will understand these waters that much better and will be better equipped to develop more effective conservation measures. I understand that a few fisherman have raised concerns regarding the right to fish in these waters of the area is placed under further regulatory provisions; however, not only are there no current indications that fishing will be restricted, fishermen must look to the future and realize that if steps are not taken to preserve and protect the estuary then one day there could be no fish left to fish. I support the designation of the Heeia site as a NERR estuary because I believe it will lead to better scientific understanding and community management and will preserve the waters for use by future generations. Thank you for the opportunity to submit testimony on this matter. Jacqueline Baker
		3/6/2014	

Gerald Takayesu Head, Storm Water Quality Branch Division of Environmental Quality Department of Environmental Services City and County of Honolulu	gtakayesu@honolulu.gov	3/7/2014	Comments contained within a letter from agency. (ATTACHED)
Ilona Lopes	jonesjen@hawaii.rr.com		Aloha Rebecka, Our Jones Ohana is a registered organization of over 300 members who are descendants of Heeia Ahupuaa. We have lived on this land for over 200 years. At our last meeting the information of this proposal Reserve System was presented to us by Rocky Kaluhiwa. Our family organization would like to go on record as being in full support of this research reserve. Mahalo,  President William Claude & Ma`ema`e Jones Ohana

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Neil Abercrombie
Governor

Brian Lee
Chairperson

Anthony J. H. Ching
Executive Director

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File: PL HEEIA 17.2.1

January 8, 2014

MEMORANDUM

TO: Jesse Souki, Director
State of Hawaii Office of Planning

FROM: Anthony J. H. Ching, Executive Director
Hawaii Community Development Authority

SUBJECT: Site Selection for the National Estuarine Research Reserve System ("NERRS") in Hawaii

We offer our full support for the selection of the Heeia Estuary in Kaneohe Bay as the preferred site for designation as a NERRS in Hawaii. The Hawaii Community Development Authority is landowner of the Heeia Community Development District ("CDD"), identified as Tax Map Key: 1-4-06-16:001. The Heeia CDD is included in the proposed Heeia Estuary boundary area. We believe that the NERRS program is consistent with the goals and objectives of Chapter 206E, Hawaii Revised Statues, pertaining to the development of culturally appropriate agriculture, education, and natural-resource restoration and management of the Heeia wetlands.

Please feel free to contact me should you have any questions.

AJHC/ST:py

c: Kanekoa Schultz, Kako'o Oiwi

RE: Submission of comments due

Hi'ilei Kawelo to: Rebecka J Arbin 03/10/2014 01:33 PM

History: This message has been replied to and forwarded.

February 24, 14

Re: Designated He‘eia NERR Site

To whom it may concern, aloha,
My name is Hi‘ilei Kawelo, Executive Director of the non-profit organization, Paepae o He‘eia that manages and has been caring for He‘eia Fishpond over the last 13 years since 2001. Paepae o He‘eia is one of the partnering organizations that put the proposal forth for the He‘eia NERR. Other partners include the Hawai‘i Institute of Marine Biology, Kako‘o ‘Ōiwi, Kama‘aina Kids, Papahana Kuaola, Ko‘olau Foundation and the Ko‘olaupoko Hawaiian Civic Club. All organizations have and continue to do work in the ahupua‘a of He‘eia. I have nothing to hide, and I have no hidden agenda. My work is simple and transparent, I want to continue to fish in the Bay, want to see our watersheds improved so that the freshwater making its way to the Bay is as clean as possible and want to restore He‘eia Fishpond so that we can raise fish and eat fish that has been sustainably-grown!
I strongly support the He‘eia NERR designation.
While I have a professional interest in the designation, meaning, additional funding for the ahupua‘a of He‘eia in the areas of research, education and stewardship, this testimony that I‘m submitting is on behalf of myself as a community member, resident of Kahalu‘u and a 5th-generation fisher of Kāne‘ohe Bay.
I grew up fishing. I only fish in Kāne‘ohe Bay. I grew up gathering limu, catching crab, catching he‘e, spear fishing, torching, setting fish traps, laying net, surrounding schools of Mullet, Pu‘alu and Weke. I grew up the same way as many other fishermen of the Kāne‘ohe Bay area. Despite my first love of fishing, for the past 15 years, I have been working to restore He‘eia Fishpond, it has become my life’s work! I take pride in my work knowing that this is my community and the the life of a fishpond caretaker is in my blood. My great-great grandfather, (John) Kawelo lived at Wailau, now referred to as the area St. Johns by the Sea. He, in his time living there worked on the walls and cared for the small fishpond referred to as Senator Fong’s pond. On my Chinese side, my great-grandfater, my kung kung and his family took care of a fishpond in Kāne‘ohe, Kahanahou Fishpond.
My dad, uncles and cousins many years ago during the late 80’s, early 90’s served on the Kāne‘ohe Bay Task Force that created the 1991 Kāne‘ohe Bay Master Plan. I served on the Long-Range Planning Committee and served as the Kāne‘ohe Bay Regional Council’s Fishing Representative and Chair. I acknowledge the Plan and the many hours and comprimises that were made between the community, fishers, recreational users and commercial interests represented on the Task Force. Now, almost 25 years later, the Plan is still valid but it is just that, a plan, not rule, not law, and not enforceable. Portions of the Plan have been adopted as rule, for example, those recommendations having to do with boating and commercial recreational activity. I believe much of what is happening now in the community is reflective of

the recommendations made by the Master Plan. I believe the works within the ahupuaʻa of Heʻeia are all positive and are consistent with the recommendations of the Master Plan.
When the Master Plan was written, there weren't as many community-based stewardship and restoration activities as there are now between Kāneʻohe and Kualoa. Times have changed in the last 25 years since the Master Plan was written. We continue to fish in the Bay and gather resources along the shoreline, but I worry the extent to which we can go on the way we do. In the last 25 years there has been a huge increase in the number of users of the Bay, with that comes increased pressures on the resources. Within the Heʻeia ahupuaʻa, we have built a partnership that's taken 15 years and are continuing to strengthen our relationships and collaborations. We're attempting to restore an ahupuaʻa complete with a healthy watershed, forest, stream, loʻi, fishpond, estuary and reef, something that's never been done in the entire State of Hawaiʻi.
I consider myself fortunate to be one of a select few individuals that is able to live and work in my community. I pride myself on the work that I'm able to do and the positive impacts that my work is having in our community. It's my life's mission to make the practice of ʻāina-based learning and community stewardship regular in our community. The ahupuaʻa of Heʻeia is providing the model of community-based stewardship and management, mauka to makai in the Kaneʻohe Bay area, I can't wait to see what will happen in the rest of our Kāneʻohe Bay ahupuaʻa. Change is uncomfortable, but change we must, evolve we must.
The Heʻeia NERR is a good thing for our community and hope that through the designation process we can further work to model community-based stewardship and be the example for Hawaii of what it means to be a healthy functioning ahupuaʻa in the 21st century.

Me ka haʻahaʻa,
Hiʻilei Kawelo

Hi'ilei Kawelo Executive Director Paepae o He'eia, He'eia Fishpond www.paepaeoheeia.org
office: 236-6178 fax:234-1999

To: hkawelo@hotmail.com
Subject: Submission of comments due
From: Rebecka.J.Arbin@dbedt.hawaii.gov
Date: Mon, 10 Mar 2014 13:06:40 -1000

Hi Hiilei,

Did you re-send your comment letter to the NOAA email address? Can you please re-send it to me as well? I want to make sure we get your comments recorded.

I'll be compiling all the comments and look forward to getting yours soon!

Thanks,

Rebecka

Rebecka Arbin
Planner
Coastal Zone Management Program
Office of Planning
Dept. of Business, Economic Development & Tourism

235 S. Beretania St. 6th Floor
P. O. Box 2359
Honolulu, HI 96804

(808) 587-2831

February 27, 2014

Re: Support for He'eia Ahupua'a to be designated as a National Estuarine Research Reserve

He'eia State Park strongly supports the nomination of He'eia, O'ahu for designation as a NERR (National Estuarine Research Reserve). It is our belief that this designation would improve the quality of He'eia's ecology from mountain to ocean by enabling more research, education, and community based programs.

He'eia State Park is operated and managed by Kama'aina Kids, a not-for-profit youth education/enrichment provider. We operate educational eco-tours in Kane'ohe Bay for children and adults. In addition to our daily eco-tours and our youth water sports programs, we have many other organizations and programs that utilize park facilities on a daily basis. Each of them is community based, and focused very much on both cultural and ecological education and preservation. We feel strongly that a NERR designation would help us to provide more and better opportunities to the community. We believe that this designation will enable better awareness raising and education, and that in turn will make the entire ahupua'a a healthier environment.

Thank you very much for your consideration in this process. Kama'aina Kids and He'eia State Park will support it in any way that we can. And we look forward to all the good that can come from this designation.

Sincerely,

Raymond Sanborn, President, Kama'aina Kids

Andy Carre, Park Manager, He'eia State Park

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
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KIRK CALDWELL
MAYOR

LORI M.K. KAHIKINA, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:

SWQ 14-016

March 7, 2014

www.hawaii.nerr.comments@noaa.gov

Mr. Jesse K. Souki, Director
State Office of Planning, State of Hawaii
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96813

Subject: Comment on the Proposed Selection of Heeia Estuary as a National Oceanic and Atmospheric Administration National Estuarine Research Reserve System Site

Dear Mr. Souki:

The City and County of Honolulu's Department of Environmental Services (ENV) appreciates the opportunity to comment on the proposal to designate the Heeia estuary in Kaneohe Bay as part of National Oceanic and Atmospheric Administration's (NOAA) National Estuarine Research Reserve System (NERRS).

The department supports the goals and objectives of the proposal to nominate the Heeia estuary being included in NOAA's NERRS. As the nearshore waters of Kaneohe Bay are designated as Class AA water that are to be protected, it is appropriate for the Heeia area to be the subject of long term research, water quality monitoring, education and coastal stewardship.

The department is interested in learning more of NERRS and the changes planned for the area should the designation of the Heeia area be approved, as the City has substantial interest in the area with Kamehameha Highway and the Heeia Valley Nature Park being under City maintenance responsibility. Please keep us informed of the developments of the Heeia estuary designation and additional opportunities to provide input to the project.

If you have any questions, please contact Gerald Takayesu of our Storm Water Quality Branch, Division of Environmental Quality, at 768-3287

Sincerely,

Ross S. Tanimoto

for Lori M.K. Kahikina, P.E.
Director

cc: DPR
DDC
DFM

Mailed postcards, 2/26/14

Aloha,

I fully support the designation of a N.E.R.R.S site at He'eia estuary in Hawai'i O'ahu

Charlotte Lyman
45-705 Kamehameha Hwy #307
Kaneohe O'ahu Hi 96744

I fully support the designation of a NERRS site at Heeia estuary in Hawaii.

Elgin M. Duarte
720 Pahumele Way
Kailua Hawaii 96734

I fully support the designation of a NERRS site at He'eia estuary in Hawaii.

Shandry Lopes
1169 Aukele St.
Kailua, H.I.
96734

I fully support the designation of a NERRS site at He'eia estuary in Hawaii.

Elizabeth C. Lau
47-665 Ahuimanu Rd.
Kaneohe HI 96744

[illegible]
117 Palapu St
Kailua, HI 96734

I fully support the designation of a NERRS site at Heeia estuary in HAWAII.

[illegible]
47-545 Nenehiwa Place
Kāneohe, Hi 96744

I fully support the designation of a NERRS site at He'eia Estuary in Hawaii.

Nancy Davlantes
45-571 Aoenere Pl.
A
Kaneohe, HI 96744

I absolutely and completely Support the designation of a NERRS site at Heéia estuary, in Kaneohe Bay, Oahu, Hawaii.

Jennifer Nakamura
Jennifer Nakamura
47-410 Kapehe St.
Kaneohe HI 96744

I fully support the designation of a NERRS site at He'eia estuary in Hawai'i.

Joyce Hunter, Ph.D.
720 Pahumele Way
Kailua, Hi. 96734

I fully support the designation of a NERRS site at He'eia estuary in Hawai'i.

[redacted]
45-479 Makalani St.
Kaneohe, HI 96744

Comments Received on Comment Slips at Public Meeting, 1/9/14

Comment:

I am strongly supportive of the NERRS site in He'eia. Many people at the public meeting seem to be misinformed about the regulations for NERRS. Other people who are supportive of the NERRS are probably afraid to speak out against fisherman, so there seemed to be more negative comments than there are in the community.

Optional:

Name: _____

Contact Phone/Email/Mailing address: _____

Comment:

HEEIA STREAM PROBABLY HAS THE LEAST IMPACT ON BAY REEFS OF ANY OF THE MAJOR STREAMS ENTERING THE BAY. FOCUSING ON THIS ONE SUB-COMPONENT OF THE BAY'S WATERSHED DISTRACTS ATTENTION FROM THE SEDIMENTATION, NUTRIENT INPUT + WATER DIVERSION PROBLEMS WHICH ARE MORE ACUTE WHERE THE OTHER STREAMS ENTER.

RATIONALE FOR THE RED OUTLINE ON GOOGLE EARTH VIEW IS NOT CLEAR. IT IGNORES THE EFFECT OF TRADEWINDS ON CIRCULATION IN THE BAY

Optional:

Name: _____

Contact Phone/Email/Mailing address: JSTIMSON @ HAWAII.EDU

Comment:

1) As part of developing the MAMAgement plan, review and incorporate the Kaneohe Bay Master Plan ~~[illegible]~~ recommendations

2) Who will be the lead state agency or university managing the Heeia NERR

Optional:

Name: Amy Luersen

Contact Phone/Email/Mailing address: luersena001@hawaii.rr.com.

Comment: Change is always good in all of our lives, And my Comment is That There Should Be a moderate or Slight Changes First. ~~If~~ A Drastic Change like STOping all Fishing in Kaneohe is not Happening as Far as our culture goes, or is.

Thank you

Optional:

Name: Larry Anthony Lopez JR

Contact Phone/Email/Mailing address: 853-7692

Comment:

why did you choose to have a public hearing after the site was selected?
Is this the best or most representative site of a Hawaii estuary?
Why ~~weren't~~ wasn't there ~~more~~ more (state wide)/community input sought during the site selection?

Optional:

Name: Ms. Ho'ala Fraiola

Contact Phone/Email/Mailing address: hoaala@gmail.com

Comment: Access publiclaw 95-341
Religion Access
Ahupuaa

Optional:

Name: Lucretia K Leonardi

Contact Phone/Email/Mailing address: 85-1363 Halupoe Pl
Waianae, HI 96792

Comment:

Can research initiatives be added to the proposal?

~~I~~ Will you/Can you send out the proposal to the community so that we can comment on it?

Optional:

Name: Ms. Hoala Fraiola

Contact Phone/Email/Mailing address: hoala@gmail.com

Comment:

More info on subject, I am a landowner on beachfront north of Kaneohe bay, I am a fisherman, and a taro farmer, native Hawaiian, with these rights to be ~~responsible~~, just responding, please get back to me

Optional: I am interested and committed for best interest

Name: ~~Keoki~~ Fukumitsu

Contact Phone/Email/Mailing address: KeokiKaloman@gmail.com
cell # 808-589-6146

Comment:

1. Who are the "community Partners"?
2. What are their Goals and Objectives? SPECIFIC GOALS
3. Who and How was the "Degraded" condition of the bay determined? What are the specific needs?
4. Who are the leaders? ~~need~~ organizational chart?

Optional:

Name: TROY OGASAWARA

Contact Phone/Email/Mailing address: TROY@GESTECHSOLUTIONS.COM

Comment:

Looking at the map of the designated area, it's clear there are lots of elements that can interfere with long-term research. Residential streets and other sources of contamination makes it less ideal than a contained site such as Kahana Valley and Bay. That site is not surrounded by sources of potential contamination that can adversely affect a long-term study.

Optional:

Name: Jean Sensai, Hawaii Goes Fishing

Contact Phone/Email/Mailing address: dean@HawaiiGoesFishing.com

Lets look at other sites that would be better suited for this.

Comment:

Why wasn't the state of Hawai'i Division of Aquatic Resources consulted and included in this process? Where are DAR's representatives?

Optional:

Name: Ms. Ho'ala Faiola

Contact Phone/Email/Mailing address: hoala@gmail.com

Comment:

Why is there no research being done that is estuarine focused?

Is this a national estuarine research reserve? OR a cultural rehabilitation site?

Optional:

Name: ms. Hoala Fraiola

Contact Phone/Email/Mailing address: hoala@gmail.com

Comment:

- How will this benefit the entire Kāneʻohe Bay from a scientific standpoint? - How is Heʻeia representative of a Hawaii estuary other than having a strong community connection?

Optional:

Name: Ms. Hōʻalo Fraiola

Contact Phone/Email/Mailing address: hoaala@gmail.com

Comment:

Dont Close the Bay

Optional:

Name: Carl Hillen

Contact Phone/Email/Mailing address: Carl Hillen 78@ hawaiiantel.net

Verbalized Comments from Public Meeting, 1/9/14

SENATOR CLAYTON HEE	Thank you. Aloha, everyone. I came to offer my strong support for this program on a couple fronts. One is that this program provides an opportunity to leverage federal dollars, $1 million, and provides the state the opportunity to enhance science through the Hawaii Institute of Marine Biology at the University of Hawaii and does so to address climate change and does so without inhibiting the ongoing activities of people who are fishers in Kaneohe Bay, people who collect resources in Kaneohe Bay, people who participate on a daily basis as I did growing up on Mahalani Circle. Like many of the old-timers here, I have experienced many changes. I was one of the – I was very young when clams were being dug at the end of Waikalua Road and going to see the sewage kill everything in the south end of the bay. This provides a tremendous opportunity to provide for the next generation and the next generation, and it does so without inhibiting or precluding the activities, the ongoing activities of fishers in Kaneohe Bay. I understand that there may be those who may not support this program for various reasons. I want to be clear that this is just the beginning from my perspective, Heeia, and it is the beginning of an opportunity to protect the bay, its resources. I applaud the governor for stepping up, and I assure you and the governor I will do everything I can to make sure that the matching funds are included in the state budget. I'm very humble to be able to live in my lifetime to see a bay that was at one time the toilet bowl of the windward side be cleaned up and have the federal government participate so that all of us can enjoy the bay as I did when I was a youngster. So mahalo to all of you for coming. Aloha.
REPRESENTATIVE JESSICA WOOLEY	I also -- I am from the State House and want to also express my support and really thank the governor for his leadership on this. It is such a great opportunity, and I think one of the aspects I really get excited about is it starts at the community level and it focuses on the community first, and then it takes it up and out and addresses a problem that affects everybody in the world, in my opinion, global climate change. We really are on the forefront of that issue, and we should be looking very closely at the science, at everything we can figure out about how it affects our lives, our environment. So I really applaud his effort and all the community leaders who are stepping forward. And there are going to be concerns. There are going to be a lot of questions, and I'm sure everybody's not going to agree on everything, but that's the wonderful thing about getting the city and working together on a project like this. Just seeing the people in the room, I think, shows that there are a lot of people who want to take advantage of this opportunity and make sure we address those challenges. So I want to leave with just a mahalo and it's a new day and thank you, everybody, for putting in the time tonight and taking time out of your family's day as well. Aloha.
MR. ERIK FRANKLIN	Aloha. Good evening. I just wanted to invite -- I was a member of the siteselection team that presented for Heeia. I'm a professor at the University of Hawaii, Hawaii Institute of Marine Biology. And as part of the community, I just wanted to stand up and basically introduce myself and see if you have any questions about the process and what we went through to make the decision and kind of the science behind it and maybe some of the resources that would be available that you'd be interested in. Please come and talk to me throughout the evening. Thanks.
MS. JO-ANN LEONG	My name is JoAnn Leong. I am a professor and the director of theHawaii Institute of Marine Biology. I was born and raised on Oahu and I grew up in Kapahulu and spent all weekends in Kaneohe. So this is my home. And we went through this -- When I took the directorship of HIMB, we worked with the community and we are working with the community now. It represents 10 to 12 years of outreach and effort with them, and it has been a wonderful experience. But we saw this opportunity as a group to put this Heeia estuary together as a NERR site, and it was coming together of Paepae OHeeia, Kako O Oiwi, Ko'olaupoko Civic Club, Kama'aina Kids and many of the other community members that because I'm standing up in front of you, it's gone from my brain. But it has been a really great experience. They all feel that it's something that we can do here. It's about time Kaneohe got some of those federal dollars. It's time. And it's time for us to now begin to now work as a community to try and restore it because those are the resources -- I used to go fishing every weekend. I can't do that now. And my dad goes out and he collects and catches the same puffer fish every time and throws it in. He used to be a good fisherman. It's just that it's not the same. And like Clayton and Jessica Wooley, I want to bring it back.
MR. DON MAY	My name is Don May. I'm at 46-240 Ahui Nani almost across the way here, and moved there because we have a delightful view ofthis wonderful wetland that's down here. I can only applaud and thank all of you so very much for carrying this all this far. I'm also chair and current director of agroup called Earth Corps that does restorations elsewhere, and like other folks, I came from Santa Monica forebears back to when it was part of Mexico and a fisherman and watched the decline of the Santa Monica Bay, primarily because of sewage being dumped out there, and was appalled when I moved over here to see the same unfortunate thing unfolding right here. So Marian Kelly did a lot of the original work, an old friend, on fishponds and Heeia's fishpond in particular. So we watched this for a long time. The one thing that we noticed touring around on the wetland reserves, what made them the one thing that they all had in common that madethem successful was a broad base of community support that realized just how important that wetland was to their community. So I'm especially delighted to see outreach and all the folks that are here. I will get some comments in when I can make something meaningful in writing. Thanks.

MR. LARRY LOPEZ, JR.	Aloha. My name is Larry Lopez, Jr., and I'm born and raised here in Kaneohe Bay, ku'u home o Kahaluu. I just wanted to stress that, you know, as I grew up, everybody knows me. I'm the Kahaluu crab master. But growing up, you know, there was a lot of ground. We could go almost anyplace in the bay and crab and fish, but as we grew up and years went by, signs went up. You know, my places of fishing and crabbing got smaller and tighter. I'm just concerned about that even getting more and more stressful, you know, when you get signs and, you know, game warden coming up, "Oh, you cannot do this anymore." A lot of us know where I'm coming from. You know, I graduated and I went over to Aku Fishing. So we catch nehu in the bay, and you don't get nehu outside of that bay. So it's kind of concerning for me, and I'm just speaking for those guys when they gotta catch their bait to go out fishing, how are they going to go do that, you know, if they're going to shut that down, all fishing? So it's kind of concerning, you know, as far as going ahead and doing this shutdown. So I'm here to represent for those guys who are in our culture. A lot of our culture, we do a lot of our fishing in the bay, you know. So it's going to be kind of hard, but, you know, change is good and I'm willing to participate. We have -- you know, we have to participate and get along. So, hopefully, this thing is not too congesting for us like it already is getting, you know. We cannot even go by Coconut Island. We cannot go by the marine base. You know, it's getting pretty tight in this bay, but I hope we canall get along and work with these guys. Thank you.
MR. KELVIN CHING	My name is Kelvin Ching. I'm also born and raised Kahaluu. I'm kind of disappointed to hear of this whole planning processjust two days ago. When I personally attended public hearings after public hearings back in the late 80's, I think it was '89 when the master plan process was started, and thousands upon thousands of hours to create that master plan, and the thing is pretty much rubbish right now. I hope you guys spoke to some people, but I don't think that's representative of the full amount of time and effort that went into that plan. It's very sad and it's very difficult for me to trust city, state, federal on any levelwhatsoever when you guys call this a community-based plan and you guys starting from the top down. This stuff is done already. How can we kill it? That's what I want to know. There's no trust coming from me and my family because of the things that has been done to us. Just like what Mr. Lopez was saying, you guys did one fast one on us on Kapapa Island. Pretty much the same thing. We used to camp on that island. We used to go out. One lady did one study saying that the humans and the birds could coexist. The plan calls for an adoption of the island from the community. What does the state do? Shut us out. In the same time that they're proposing all of this, they say that tourists can go up to what, 300 people per day or something like that or 30 people per day and then what? They shut out the locals. We no can even go above the high-tide water without thinking that we're going to get caught. How the kids going to go learn how for fish? This is sad. What kind of community-based management is this? Look at what the bay doing now? You guys, Coconut Island, excuse me. Maybe not you guys personally, but Coconut Island in general. Look at the bay. Look at all the limu. You guys brought 'em in. Now you guys get grants for clean 'em up. You guys create your own problems so you get more grants. Kind of sad, you know. What about the taro now, the other taro that's taking over the bay? You guys know about that? You guys blame the fishermen. Yeah, the fishermen take and I think we all agree we take, but there's a whole lot of other reasons why the bay is in decline. And, yeah, I understand the money part. Money is good. Why we gotta have the designation? Why we gotta shut people out? Because you know what, guaranteed you guys are going to say people no can do this, no can do that. This is just a foot in the door. Once the door is cracked open, you guys going to open 'em up wider. That's the trust that I have. Zero. Okay? I hope you guys take that into consideration because so many people, they give up coming to these meetings already. The thousands and thousands of hours we had to the regional council, that went shut down. What's going on? Anybody reach out to the regional council, previous members? Because I was there. I didn't hear this through neighborhood boards. I hope you guys went there. I just heard about this meeting two days ago. Literally. That's sad. We don't even get to look at this stuff. We got three minutes we gotta do it. We no can even look at this stuff. That's the kind of community management. How you guys reaching out to the community? You guys gotta go talk to people. Go knock on doors. Just cut the money and you get deadlines. Do 'em right. That's sad.

MS. JENNIFER NAKAMURA	Okay. Just to follow up, not just what the governor had to say, but to follow up on the comments prior, just so everybody knows, the planning is actually not a plan that was directed and implemented straight from the state. It actually is not from the top down. It is from the bottom up. There is a number -- there are, I should say, a number of community organizations, such as, Kako O Oiwi, Paepae O Heeia, Ko'olaupoko Hawaiian Civic Club, Ko'olau Foundation. Yes, in partnership with UH because UH provides funding to preserve and, you know, sometimes to help with more research for the things that we did grow up loving and learning here. We work with -- some of the kapunas that are in these organizations have been taking care of, very specifically, Heeia from the mountain to the ocean for the last 20 years. Some of their ohanas have been here for 200 years as the stewards of Heeia. Another thing I think is really important to note is in this plan, there is no ban on fishing. In this plan, you are still able to fish. You're still able to paddle your canoe. You're still able to go diving. You're still able to go crabbing. They are not banning the activities that we already have or enjoy or live. Some of the kapunas that are involved or have been involved in this project from the beginning, their original intention was to see the life come back to the bay. I was born in 1983. I remember in the '90s playing in Kaneohe Bay and there was not much left. There was a lot of dust and dirt, and we lived on Lilipuna. My mom said when they were little, there were oysters and fish all at the pier right at our, you know, property line, but by the time I was 10, there were no oysters in my yard anymore. And I think significantly, you know, into the early 2000s, we saw a lot of fish and a lot of, you know, animals and a lot of life come back, and maybe that has something to do with the efforts that people, you know, from our community have put into restoring things. I'm not sure if you guys are aware, but from the valley, up in Haiku Valley, you know, those projects, things like that, the amount of work that's been put into our community not only as far as intellectual or paperwork or like technical work, but also physical labor and people in the streams, people bringing the kids to learn how to cultivate or keep the streams free and clear so that the water can flow back so that our bay can, you know, be restored to have the cycle and be clean and, you know, so that we can propagate, produce and sustain ourselves in this place that we love. So I just wanted to really make it clear that it's not going to be a state -- it's not a state trick. It's not a -- and I'm totally -- I'm totally with -- I agree totally. I've been to so many city and county meetings. So I can empathize with the gentleman because there's a lot of times where I've gone to meetings and I'm like in tears, and it's hard because, you know, emotionally, we love the place that we're from. We love the activities that we take part in. We love the land. I'm sure we all feel that way. And I want you to know that the organizations that I mentioned that are partnering to work together to do this project have nothing but the best intentions for our community, for the kids. Like I said, there's absolutely no language that says that they're going to ban fishing. And, actually, the intention is because we want the community's support and we want everybody to be together so that we all, you know, can continue to maintain and enjoy what we already have. As far as the management plan, you know, later in the future, it's not going to be -- like I said, it's not really from the top down. It's really from the bottom up. And I think that you might be relieved if you come and talk to the members that are our partners, you might feel some kind of relief, and you might actually want to be more involved in what they're doing when you get the chance to hear everything that's been going on. And it really is impressive. So I really suggest, you know, finding out more and reaching out to everyone and getting involved and everything like that, so...
MR. JACK JOHNSON	My name is Jack. I was called before. So I'll go ahead and speak. First, I'm sure I speak for everybody when I -- a lot of us -- Hats off to trying to clean, as the senator stated, the toilet bowl is what Kaneohe Bay has become. The second and I realize, Governor, you have your process and procedures to get the answers, but I feel that over half the people in this room would sleep better tonight if we actually knew from a competent authority such as yourself or a senator. Jennifer did state that there are no impacts against personal boating and fishermen and other commercial entities that work in the bay, but I think we really need an answer to clear our heads and make us feel better. Is there going to be any impacts with recreational boating and fisher -- fishing in that bay with this -- with this thing?

MR. MICHAEL CHUNG	Hi, everyone. My name is Michael Chung. If you guys don't know me, I'm always down at the pier. I'm always in the bay, always with my kids fishing, diving, crabbing. Our family's been fishing in this area for years. My grandfather built the first house in Pokole. While they were dredging the channel to fill in the fishpond, his house was being built. So we've been here for, I'd say, about 60, 70, 80, maybe 80 years. Okay. I'm kind of sad that, like my other cousin Kelvin said, that we're kind of afraid of what's going on because we weren't notified. We only had to look at the literature, but we got it right here. Nothing was sent out. My own cousin who's proposing this -- I mean, she's on the site thing. -- hasn't approached us. I wish she did because, I mean, she has her agenda too and she wants to do this and I -- you know, she does a lot for the fishpond, but sometimes we don't see eye to eye. Okay. Like Kelvin said, you know, if you're going to protect this area or protect the bay when you get the foot in the door, where else are you going to go? We don't want to see any of our bay gone. We're already -- like was said, Kapapa is off limits already to us to camp overnight. We can go on the island daytime, but we cannot camp overnight. My family -- all my family members used to camp there. We used to take our kapuna out there. There's burial out there. There's a lot of history out there that we used to take care. We used to coexist with the birds, and we went through various meetings for that, but now I don't know. Can you bring that back? You said, you know, that you could bring back too. You know, there's fishing clubs that's been going out there for over 50 years. That's their annual event. Why can't we let them go? They've been going there for ages and coexisting with the birds. One -- I mean, this is just an example. One bunch of homeless guys go out there, and they screw everything up for everybody. Why can't we just eliminate them? You know, you look at the island now, everything's overgrown, all the weeds, everything. Those guys from Atlapac, they used to take care of the island. They used to lawn mower the grass back in the day. Why can't we have that kind of thing? We can only go there overnight now on certain days with a permit, and a permit is only 10 people per permit. Yeah, sure. All right. I'm very glad and I'm pretty sure Atlapac is very glad to have this option. But what happens when you don't get re-elected or something like that? You know what I mean? No, no, no. I mean, we see it all over. I work for the fire department. We got a new chief. Everything changes. A new person comes in and they have their own agenda. You know what I mean? You know what I mean. I know that. You just approved it. All right. I hope -- I hope it's true. You know, 'cause like you said, Kaneohe Regional Task Force, they had that plan and basically nothing was implemented. All right. Thank you. Also, getting back to my agenda, you know, like you guys said about water issues and Lopez brought up the aku boat, you know, they've been taking our water from Waiahole, Waikane, all of that, and that water is needed for the bait. The bait comes. The moi comes, the mullet, everything. Okay. So we need the water. We need that freshwater that's going the other side. Okay? I know they need it for the homes and people and the farms, but if we're talking about the bait fish and everything, we need it here. Okay? And we only got one aku boat. Let me remind you. We only got one aku boat, and don't ever say that they are catching all the bait because you only got one boat.
MR. CHUNG (CONT'D)	Also, what about the invasive seaweeds that UH here, University of Hawaii, let go? It's rampant throughout the bay, inshore, offshore, on our reefs. If you look in front Heeia's fishpond, it's loaded all the way throughout the whole bay. Why can't something be done with that? I mean, it's covering -- it's blanketing our coral and sand. You know, and we talk about there's an invasive coral. If you are out there and you're looking for your he'e or octopus, you know that's invasive because it's covering up the coral that the octopus likes, you know. So I mean, it's -- how are we going to do that, you know? You gotta keep an eye on 'em. That's what you're saying. Okay. Thank you. Wait. One last thing. Where does the tour groups go that's inside here? Are they going to leave? You know what I mean? Because this reef right here is where the tourists are and over here (indicating). They're diving inside here and they got their jet skis and everything and they're anchored over here. Are they going to be displaced? I mean, I don't see anybody that's representing them here, but everybody wants to know because as fishermen, if they're being displaced, where are they going? Are they going out to another reef where we go? Because I have issues with them. They're supposed to be on one side of this reef, but they're not. They're on this side. So I gotta tell the harbor master, and he's gotta talk to them. They know the rules. All these commercial guys know the rules, but they're not following it. It is, and believe me, enforcement is hard. Give them money. Give enforcement money. They need it. All right. I'll talk to them and tell them I told you that. Thank you.

MR. KAUAOA FRAIOLA	Well, mahalo for having this community meeting, you guys, and it makes me really proud to see our community together here and discussing, presenting our different views and respecting each other, and we're going through this process because I think it's very important for us to do this together and to move slowly together. Because I too was surprised when I heard that, you know, there was this going to be this site because I work in this area. I grew up in this area. I do research in this area. And all of a sudden, I heard that it had been proposed as a potential site and that it was coming from the community, and I thought, oh, what am I? I said, oh, I guess they never have time to talk to everybody because you get plenty of us guys and some of us guys maybe wasn't in their groups. But, you know, I applaud that we're here talking about it, and I understand what the governor and what Director Souki's talking about. Like this is part of the planning. Yeah, the other part was part of the ground up and we're the rest of the ground up, I guess, from how I understand it here tonight. I have concerns, and Director Souki knows and NOAA knows because I wrote something out to explain it. So no need me go over through all that kind of stuff again because plenty of you guys that wasn't on the list already got to talk several times. I don't know. But I like to keep everybody here. I want to keep everybody here, but I do have concerns and, you know, I hope as we move through this process, that those concerns are taken seriously and that people who do have concerns are respected and not treated as outsiders; that we're all in this together. People have concerns, people who support it and are pushing it forward and that only together we can move forward and do what the community wants and what's in the best interest of the community, and the community, community, community. And I think that was it, and so I guess I'll give it to the next person. Thank you very much.
AUDIENCE MEMBER	Part of -- I think just maybe part of the trust issue with the community in a plan like this, if we could see the emails and the comments of other community members not redacted, that would be really good, I think. That's just a suggestion.
MS. LUWELLA LEONARDI	Thank you, Governor. Thank you for that intention. I don't know if you remember me, but I walked up to you and I said, "You're going to be my governor, and what I'd like to see is a fisherman in your cabinet." So thank you. My name is Luwella Leonardi, and, yes, I am Attilio's wife. So I want to make a comment about the water. It's really important because I'm on DHHL. I'm on Hawaiian Homes. We are now going through water policy, and it's such a huge, huge problem right now. The fact is I'm from Waianae. The reason why I'm here is because I attended the first CZM in Waianae. People from Kailua and everyone else has come out to Waianae. Then the meetings were taken outer islands. Then there was another meeting, and in-between that one was at King -- no, at Washington Intermediate. There Mr. Copa was there. In-between that, we had a meeting with Mr. Copa and George Parish and all the fishermen in the office. So it's been pretty interesting. I've been going through a lot. The reason why I'm here is because my mo'okuauhau is here. Edward Ni'aupi'o was the only taro farmer, and Pukunitsu (phonetic) is in here tonight. He was the only taro farmer with McAllister and Andy who did some research, and it was because he knew where the water is and he was strong enough to stand firm in Waimanalo. You can read the story in Sites of Oahu. The other problem is my dad died and born in the same place. We still have that address in Maunawili. The other problem is Heeia, which is Heeia from mountain to sea, ahupua'a, that's a problem that we in Waianae are struggling with right now. Talk about the bottom line. This is my bottom line and this is the truth. Come out to Waianae Harbor. The bottom line there is the little children that are growing up under the tree. That's my bottom line. And I feed homeless twice a week over there, and we finally got everybody else to come in and join us. We have about maybe about 150 people living under the tree. I was there when Sus Ono also -- also did the -- down at Sand Island when you got rid of the people there. I just want to let you know fishermen are part of the homeless and they're out there, and I am so ma'a to what they have to say about how to take care of the ocean, how to take care of the shoreline.

MS. LEONARDI (CONT'D)	If you go down to Waianae Harbor, you will see the kids respecting the opae ula. That is our sacred -- our sacred place, but is it alive? No. It is there and every day when the rain starts, our people look forward for the opae ula to fill up with water because they know the opae will grow. But here's the thing, we don't have any groundwater surface protection in Waianae, and I hope and pray that I never see that happen here on this side. And, yes, I was in Kahana Bay before those six wells were drilled so that -- I'll be honest with you, so that Kailua could have their swimming pool filled with water. That's the reason why a lot of the water -- that six water wells was drilled. I was there when Mr. Bernie – when Mr. Sus Ono was arguing with us. Thanks to Marian Kelly who came out. She put a stop to the draft, the deep-draft harbor of Kahana Bay. The reason why I'm so onto this, because my grandfather -- I was born and raised in -- I was born in Kapahulu. My grandfather was a captain of Hawaiian Dredging. He did all the dredging in his time. So I know what dredging means. And it was also a very family sad legacy for us. But I want to take you back. We also did public law of 95-341, which is access, which is the religious access from mountain to sea, religious access for us. I was with Uncle Sam Lono. My husband carried Mr. Uncle Sam Lono out of the valley when he was working for the fire department. He carried Uncle Sam Lono his last trip out of the valley. I also took my husband up to see the taro farms that are growing up there because Uncle Sam's brother took over the area. You need to understand the Hawaiian culture. You need to go back 200 years and peril (sic) out all the scientists. I know this because I sat in a cafeteria just like this in sixth grade when Chad Pryor (phonetic) came in and said, "Oh, we're going to feed the world." All that I can remember him doing was putting a wholphin and – a dolphin and a whale together and coming up with a wholphin. I got pictures of the wholphin. I thought he was cute. But did that feed the world?
MS. LEONARDI (CONT'D)	Now, the other problem I'm concerned is JoAnn, JoAnn Leong, she's in charge of Coconut Island. Well, she's going to retire soon, and she does some fantastic research on cancer. I'm concerned who's going to be next in her line. I am concerned who's going to be the next scientist. I want to see somebody that comes from our island that becomes that scientist that's in charge – the director of Coconut Island. The other problem too, I work in the DOE. We cannot teach our children how to fish in the DOE. We have to do -- we have to do facts and data and charts and whatever. We cannot teach our children how to take care of the aina pragmatically. We cannot do that. So there's a lot more. I know about the gorilla weed and that other weed because I filmed it over in Hawaii Kai and how it's spreading all the way out to Waikiki. If you really want to know what happens to your shoreline, we did a hukilau and we did some measurements and it was really sad. A huge hukilau in Pokai Bay. There's nothing out there. All the fishermen out there cry. There's nothing out there. There is something wrong with our environment. The sludge, you want to talk about sludge? Come out to my area where I live. You'll see a whole field of sludge that came from Hawaii Kai with the mud weed and the gorilla weed and possibly coqui frogs. That's the only reason why we want it out of Waianae. We don't want the coqui frogs that possibly may grow in our community. We don't want the mud weed. We need to eat the limu. Remember, my bottom line is those children that are living under the tree… Okay. My summary is -- very quickly, my summary, Governor, I was surprised to see you tonight. Be aware of the CZM. Get on their site. Know this article was at the very, very bottom of the corner of the newspaper. I called everyone I could think of to be at this meeting. And for it to happen here in Heeia, this is the best place to be to talk about fishing. We are all dependent upon you throughout the entire archipelago, not just in Hawaii, the entire archipelago, and you can put Palmyra in there too. We are dependent upon Heeia because you can do it for us. We can't do it. We don't have our groundwater surface protection. Every drop of water on Mount Kaala is taken out of our community. None of it is flowing to our shoreline. So if you really to want to see this phenomenon, come on down, see our children growing up under the tree and look at the opae ula that the kids take care of and make sure nobody hana'ino that opae ula. So there's a lot of work to do, yes. I mean, I wish we could do without it, but I don't think so. The damage is so great. I talk to William Aina all of the time whenever I see him, and I'm in the classroom trying to do coral and both sides are not working. So the coral is important. I'm proud of President Bush for doing that sanctuary for the coral because we've got global warming coming and we've got a lot of work to do, and, again, we cannot teach our children how to fish or take care of the shoreline. They get that from their families, but they can do the science. We can do the science and we have a future. We can change. I don't know how to do it. I just don't have the answers. Thank you, Governor.

MR. THEODORE	I just came. I came late, but I was telling that young lady there and the guy I had one question, but I changed. I have one more. My first question is we're supposed to be out of here by 7:00? I mean, 5:30 to 7:00, that's all the public is worth? …. Oh, okay. I would figure at least we could have at least two to three hours meeting because we got a lot of people here that has a lot of questions, especially when people speak. But, anyway, my question is can you turn to that area that had the red outline of the area that is the boundary? Okay. You see that area there, my question is what criteria was used to make an areathis fast for this estuary reserve? The thing is the Hawaiians -- Okay. Well, this area here is not accessible to everybody because a lot of people, they fish from shore. They walk on shoreline. So my theory is you start from shoreline. You don't include a whole vast area one time. You work the shoreline first and you see how it works. Then if you want to go to that small little poepoes (phonetic) or reefs, then you work that area. Don't include the whole vast area one time, especially when a lot of the people who's on this committee or so forth, they designate this area when a lot of them, they don't know this area. They only get information from people or scientists or whoever who went to this area. Fishermen like us, we frequent that area. Like me, I've been here 30 years. People here 40, 50 years, even longer, they know these reefs. Like Mike Chung was saying about the octopus, that's seasonal. So a lot of the area here is seasonal fishing. So I know this estuary is important, but the thing is you start from the small areas first. The Hawaiians just do the same thing. They start from areas. They work their areas. When it's done, they harvest what they need. Then they move to other areas and they kapu that area. That's how it's gotta be done. You cannot just close a whole vast area. No. It's going to close. It's a reserve. It's a reserve. What is a reserve? You cannot fish there; right? Oh, the uses don't change? That's what they all say. Thank you.
MS. ROCKY KALUHIWA	Jesse, just to go backtrack and brush up everybody on the history of the Heeia ahupua'a because our family's been here over 200 years. My grandfather was the last of the konohiki for the Heeia ahupua'a. But backtrack, remember now, Heeia Kea was once going to be a nuclear power plant. 1975, we won that not to be a nuclear power plant. So what is it now? It's a designated city park. The meadowlands, they call it the meadowlands, the loi lands, is now under HCDA. That was once going to be another Hawaii Kai. We fought that. We saved that. The fishpond was going to be covered up. It was going to be like Mahalani Circle. If not, they were going to make a 500-berth marina. We fought that. Heeia State Park, they were going to make a hotel out there. We fought that for Heeia. Coconut Island, there was going – the Japanese was going to make a big development out there. We fought that. We went to the University of Hawaii. Ahu o Laka, everybody was angry because they're putting three weekends a year a restriction on drinking. I said to myself what did they want?A 12-step program out there? What is three weekends? There's no problem with that. That worked out. We cannot live in the past. This is the past. We saved our ahupua'a. Now we want to restore it to its best and we can do it together as a community. And why they came to Heeia is because Heeia is already designated as a sentinel district because the people of Heeia is already working together mauka, makai. All of the projects are already working together in harmony. The lady previous speaker spoke about my Uncle Sam Lono. These are our families. We all have kuleana lands here. My family ran the last poi mills. We got two poi mills in Heeia. We're trying to restore that. Give us a break. Why they met with the Heeia ahupua'a people? It's because we're talking about Heeia. Eventually, we're going to branch out to everybody else. So if we had everybody, it's going to be like tonight. Two hours is not enough. So let us move on. The Kaneohe Bay Regional Council, it's not dead yet. This has to go before the Kaneohe Bay Regional Council. I asked Senator Hee. He said, "Well, talk to Representative Ito." And I also asked the DLNR. That's still ongoing. We still have to go together. You know, we can do this together if we're going -- HIMB, I was one of them totally again HIMB because of the limu. You can't blame JoAnn Leong. New administration, they're cleaning up the mistakes that we made in the '60s. So give it a break. Let's work it together as a community. We're going to fight each other, it's just going to put each other back down to the toilet. Thank you.

Comments Received on Comment Slips at Public Meeting, 2/27/14

Comment:

I WOULD JUST LIKE CONFIRMATION THAT SOMEONE WOULD STILL BE ABLE TO ANCHOR AND SNORKEL AT A CORAL HEAD INSIDE THE NERRS SITE

Optional:

Name: DAN WILLIAMS

Contact Phone/Email/Mailing address: ROLLERSKATE-HI@CLEARWIRE.NET

Comment: support the NERRS

- would like to expand the NERRS boundary to include all of the HCDA lands.
- would like to make sure that the agriculture, fishing, & aquaculture activities remain w/i the NERRS area.
- Partners should include ~~more~~ community groups & NGO's such as Conservation International.

Optional:

Name: JASON PHILIBOTTE

Contact Phone/Email/Mailing address: jphilibotte@yahoo.com

Comment:

Boundary of the NERR should include the entire ahupuaa of Heeia for a more comprehensive application of management, research, resource, and a (whole systems approach)

Optional:

Name: Donna A. K. Camvel

Contact Phone/Email/Mailing address: 358-1354
donnacmd@hawaii.edu

Comment: I've fished all my life in K Bay leave the bay along for our family and friends. The bay is used for food source for alot of families

Optional:

Name: R. Patacsil

Contact Phone/Email/Mailing address: r_patacsil@yahoo.com

Comment:

Kaneohe bay has been apart of my life for as long as I can remember. I am 20 years old, but my family and I have been fishing & diving there for as long as I can remember. The bay is where my parents taught me how to swim and do all my water sport activities. The Nerr sounds like a great idea as long as I am able to continue my normal activities.

Optional:

Name: Austin.

Contact Phone/Email/Mailing address:

Comment:

Please provide us a colored areial view of this huge proposal.

Optional:

Name: Josephine Patacsil

Contact Phone/Email/Mailing address: P.O Box 478
Kaneohe, Hi 96744

Comment:

Diving should not be taken away just so people can use it as a research site. The area for research doesn't need to be so big. It could be a little section of Kaneohe Bay. You can't just come and take away something that people been doing since their childhood. Just because you have money doesn't mean you can do whatever you want.

Optional:

Name: _____

Contact Phone/Email/Mailing address: _____

Comment:

aerial map without shading

Optional:

Name: _____

Contact Phone/Email/Mailing address: _____

Verbalized Comments from Public Meeting, 2/27/14

MR. KUKEA-SHULTZ	Aloha. My name is Kanekoa Kukea-Shultz. I'm the executive director for Kako O Oiwi. I'm also speaking on behalf of Nature Conservancy. Can you hear me? We support the NERR. We're restoring our point today whether there are taro patches in there, and the reason why we support it is the fact that it gives opportunity for our children to really get the best experiences in terms of research and education on how estuaries are impacted. Whether it's through our farming, fishing, cultural activities, the NERR is just a great opportunity for us in terms of funding to further our ability to take care of our children and take care of our people and the future of Hawaii. So we definitely strongly support it. Mahalo.
MR. CHING	My name is Kelvin Ching, and I was here the other week for the other meeting. My testimony still stands. To answer the question simply, I oppose. I appreciate that folks went over the comments. You folks heard us. We see some suggestions that you folks have actually listened and put the public comments on an active -- on the website. Thank you for that. The fellow earlier, he said, you know, the good things about this NERRS is that we can implement parts of the Master Plan, and I totally disagree with that. They already implemented parts of the Master Plan and that's the problem I have with it is when they implement parts of it, it affects other parts which should have been implemented, but it doesn't get implemented. The best solution is to not have this NERRS. If there's money to be put towards this area, come on down, put it in. Just don't have the designation. The problem that I see is right now, you say that there will be fishing allowed, but who knows what's going to happen in the future. There is nothing -- I have seen nothing in any of this that prevents it forever going forward and that's the problem I have. Okay? And I agree with all the other testimony that came up about opposing it. The definition of an estuarine, it's not all the way out to HIMB. I agree that the lo'i is a good thing for the future. I agree the fishpond is good for the future. That's preserving history. We need that, but we cannot afford the potential to be closing off fishing only for certain people and not everybody can go. The ocean is for everybody, and that's what's important. So don't let it happen. I disagree. I oppose the NERRS designation.
MS. HIILEI KAWELO	Aloha mai kakou. My name is Hiilei Kawelo. I am kind of wearing multiple hats right now. I'm one of the -- we're one of the partners that put forth this application. I represent -- I'm executive director of Paepae O He'eia, but I actually am here tonight to submit testimony on behalf of myself as a fifth generation fisher of Kaneohe Bay. My sister is here as well. Actually, we have a very long line of fishing in our ohana and very long line of family
MS. HIILEI KAWELO CONT'D	members that have cared for various fishponds along the Kaneohe Bay coast. I too am very passionate like my cousin Kelvin about the Kaneohe Bay Master Plan as many of our family members have contributed 25 years ago when the plan was created a lot of mana'o, and there was a lot of compromise made amongst the varying interests within Kaneohe Bay. 25 years is a very long time. A lot has changed in 25 years. The community has changed. And it's very nice to see the extent to which our community is taking control of our resources. No longer are we standing by and watching others control it for us or telling us what to do. The community is doing what we feel is right to benefit our ahupua'a. I am a Kahalu'u resident. My ohana comes from Ka'alaea and Kahalu'u. I work in He'eia.
MS. HIILEI KAWELO CONT'D	So I have the privilege really of being able to drive to work five miles roundtrip every day and work in my community of which I live in. I pride myself as being a fisherperson not limited to one specific type of fishing, but many different styles of fishing. I love to fish. I love to see my ohana fish. I love to eat fish. I love to see my niece and nephew eat fish. This NERRS designation, I am in very strong support of because I feel that our community has a lot to learn. I feel our community needs to learn from examples that are put forth by, basically, my generation. And I'm not trying to step on anybody's toes or undo what has been done, you know, in the last 25 years. I'm just saying that rather than look at the negatives of, you know, the fish and seas that government has in protecting our resources, why not look at the

MS. HIILEI KAWELO CONT'D	positives of what's going on in the community? And I feel like a NERRS designation for He'eia could provide the much needed resources to support those activities, whether they be stewardship activities, research activities, education activities. I do not feel like -- I don't feel threatened in any way by the designation as others may do. And their mistrust of government is, I think, very much founded and rooted in a long history of mistrust, but I feel like it's an opportunity for us to change that. And so I'm here representing myself and my little ohana and kind of just looking towards a pretty promising future for our community, and not just in He'eia, but up and down the Ko'olaupoko coast, yeah? He'eia is a very small part of a very large bay of Kaneohe, and so I feel like isolating our He'eia really discounts the other ahupua'a that are within Kaneohe Bay. You don't want to leave them out because they're all part of our estuary, our bigger estuary of Kaneohe, but I feel like He'eia is an opportunity to start, yeah, start someplace, provide an example, provide a model for others to follow. Yeah. Mahalo.
MS. CAMVEL	Aloha mai kakou. My name is Donna Ann Kameha'iku Camvel. My family, the Lihue, Kahanu, Paoa, Kea, Lono ohana are kama'aina of the He'eia. We reside in the ili o Ioleka'a and kuleana land that has been in our family for well over 150 years. I am -- you know, I'm a doctoral candidate at the University of Hawaii specializing in indigenous politics, but I also currently serve my passion and my community currently doing ethnographic field notes down in the wetland of He'eia in Hawaii. I'm here to provide testimony in support of the selection of He'eia as a NERR site. I'm studying environmental policy planning as well as natural resource environment management, and I support totally community-based resource management through collaborative partnerships. These partnerships produce and contain and draw from a wealth of knowledge, skills, education, and mostly -- the most important part, a culture foundation which serves the aina, the wai and the kai of our ahupua'a, including near-shore fisheries. The benefits of a designation as a NERR site will enable research, research groups, okay – Now, let's not be afraid. -- research that will aid He'eia in managing one of the most precious mixes of kai and wai, that of our estuary. This is where the wai meets the kai; right? This is where the mix of brackish waters produce our muliwai, yeah? This muliwai is extremely important and a vital, necessary component to a functioning ecosystem that hopes to restore itself. So here in He'eia, our muliwai remains. Maika'i. Mahalo ke akua.
MS. CAMVEL CONT'D	We still have that muliwai, but it has been under the onslaught of environmental and historical rain degradation, all kinds of things that have happened over the last 25 to 100, and even further than that, years of history of neglect and now being restored by our younger generations. And this is why we must support it and not be afraid. As a community, each and every one of us has the ability to be a part of this, to address any fears you may have about the banning or the kapu of fishing in certain places. You are here not only as part of this designation site, but overall a complete resource management system at
MS. CAMVEL CONT'D	your hands, at your fingertips in which you can be involved. So think about the future. Think about our kids. For us, it's a no-brainer. 50 years from now, I'm not going to be here, but I sure hope the bay is. I sure hope the muliwai is. I sure hope to see at least an acre or two, maybe three of kalo when I leave planted in the wetland. We have partners in this particular ahupua'a who have been working for the last 25 years. I want to say people like myself. I call myself a kahuna because, you know, I knew Hiilei when she was just starting out and it's wonderful to see. As a community, if we are going to restore food production, if we are going to produce food, I mean, let's be real, people.
MS. CAMVEL CONT'D	The future don't look so good. It's time for us to, as Hiilei said, take back your community. Part of doing that is not being so afraid. If you are afraid that your fishing will be cut off, if you're afraid that somehow a selection somewhere is going to ban you from going where you always used to go, well, don't be afraid. Be part of the process that helps you alieve (sic) some of those fears. Think about food production. Think about the kai, the wai. Think about Papa-Hanau-Moku-Akea. Think about the aina, yeah? As community members, we are here to malama her. We are here to advocate for her. So it's wonderful. Whether you agree or disagree, it's all good mana. But when we have advocacy for the man, we have to think about the future and the past, bring it all together, stir it all up and think about what we can do to make it better. Our kupuna knew how to manage resources, but the landscape has changed. So that landscape now is something new. In order to mitigate the problems that are contained within our ahupua'a, we have to use science. We have to use things, research. We even have to create new ways in which to go about doing those things. It's trial and error. It's all theoretical, but it's all

MS. CAMVEL CONT'D	heartfelt for the most part. So this may be an opportunity to expand what we currently know about our resources and the management by enabling this NERR site. I believe at the initial front end, it's mostly about research. So one of the ways to make that happen and start heading down that road is to support it. I support it with eyes wide open, as we should all be, with care and love of our ahupua'a and our community, but we cannot be afraid anymore and so afraid that you are not going to be giving to the aina or what could make it better. I cannot stress to you no more important how it is in terms of wai and the waters and how good they must remain in order to feed the kai down here so that the muliwai operates. From that we can get fish, yeah? So I want to mahalo kakou. Mahalo for listening to me. That's just my mana'o as someone who comes from here and has been in the process with ohanas and stuff, but mahalo. Mahalo for listening.
MS. DEBORAH LEE	Thank you. Hi. My name is Deborah Lee, and I first saw Kaneohe Bay in the mid 1970s and was spellbound then and I still am now. I'm in favor of the NERR designation for several reasons which I'll go into. You specifically wanted us to address the boundaries of that designation tonight, and so I'm first going to do that. I've seen other aquaculture projects and I've heard of them that are in trial stages here on the island that have less success than they could have because they do not have control over the upland area. You know, there's a golf course with runoff that's competing with the success of the project low near the estuaries. I'm sure we're all aware of projects like that. So this includes enough upland area to make sure that whatever money is spent has the most success possible. I also wanted to address that I'm hearing some concerns about maybe big government having some control over this area, and I just feel that parties that are involved, NOAA and HIMB, the University of Hawaii, they all have the same heartfelt mission to preserve this area that we all have locally so they can be part of a unified ohana in some respect. I personally have spent the last, you know, the last five years working with another department that's part of the Department of Commerce, and they may sound really big, but when you think about it, they have the commercial services under them and NOAA and a lot of agencies that have a lot of brainpower and resources, not only the financial resources, but a lot of scientists and people that dedicate their lives to preserving areas like this, and not just on the mainland, but globally. So they have knowledge of other similar marine environments to ours around the world. So they just have to bring us up to speed and help educate us. One of my jobs was to help local businesses succeed, and the Department of Commerce, they gave you the umbrella, the support financially and, you know, the education to help do this, but they didn't interfere beyond that. They really turned it over to the local area people and they're our government. So you know their phone numbers. You know where to find them. They're not invisible, and they can be approached if you feel that there is something that you'd like to change.

MS. KALUHIWA	Aloha. My name is Rocky Kaluhiwa, and I'm the vice president of the Ko'olaupoko Hawaiian Civic Club, and we were part of the group that initiated to put in for the NERR, but tonight I'd also like to wear the hat of my ohana. My ohana has been here for over 200 years. My grandfather was the last konohiki for the ahupua'a of He'eia. I was born and raised in the ili of Haiku. I recently, since I married my husband in 1959, been living in the ili of He'eia Kea. I just want to give you guys a short history of He'eia. Our family fought against all of the developments, the wrong kind of development for He'eia since the early '70s. Remember when He'eia Kea was going to be a nuclear power plant? We fought against that. Remember when He'eia State Park was going to be a hotel? We fought against that. I remember when the pier was going to be built. As a young girl, I took out letters – I had petitions for people to sign to have the He'eia Kea Pier built. The He'eia meadowlands, that was going to be another Hawaii Kai. Part of the plan was even to raze the broken bridge and leave a drawbridge. We fought against that. Paepae O He'eia, the fishpond, is a good job. That was going to be a 500-berth marina. We fought against that. We didn't win the law and it's a good place. Haiku right now, we fought the area in Haiku. These are the things we fought for and, you know, it's now -- we need to develop it. Better development for the people. No houses. Fishing. And if people think that I'm going to go and support the NERR and thinking that it's going to close the fishing, that's crazy. I would never do that. My grandfather was, believe it or not, a turtle fisherman. It's against the law now. So it's against the law. But if it was going to close fishing, I would be against it, but it's not. For your information, He'eia has two designations right now for the federal government. We are one of, I think, nine in-the-nation sentinel districts. We have recently become an observatory district on a national level. It doesn't mean nothing. It does mean something, but it doesn't mean you cannot go fishing. Everything stays the same. Don't be scared like Nani said. We have to look forward to the future. And come to talking about Kaneohe Bay Regional Council, I went and testified this past month on two bills for the Kaneohe Bay Regional Council and it is alive. They are going to start meeting on that. They did agree for four meetings a year. So this can be incorporated with that. I'm just letting you know my family had a meeting. We're organized. We have almost a thousand members. I have 89 first cousins. Our family still resides on the kuleana lands of the Haiku ward. There are 26 homes there. They are also in support -- they are writing a letter to support this NERR. Mahalo.
MR. HECKMAN	I apologize. I've got a head cold. I'm going to read mine so I don't muck it up too much. My name is Mark Heckman. I'm community education program coordinator for the Moku o Loe, Coconut Island. As such, it's our programs that provide the bulk of the access to Moku o Loe to schoolchildren and the community. We hosted over 5,000 people last year in that program to the island. About half of those was community groups, but the other half were schoolchildren, an awful lot of them from the windward side. They come to the island to learn about the research, learn a little bit about the history, take classes, attend marine science overnights, but most importantly, they come out to start the process of being our next generation of marine scientists, marine managers, ocean business people, ocean appreciators, and they'll be able to use traditional knowledge, modern techniques and tools, hopefully, to make a better world. I am strongly in support of the NERRS designation. It gives the opportunity to improve the water coming into the bay. Better water in, better fish, better bay, better corals and so on.
MR. HECKMAN CONT'D	Regarding the boundaries, it's not huge, but it might be a size that we can actually, you know, take care of. We can actually accomplish something in that size. We gotta kind of ramp up here. Monitoring in the NERRS will give us a snapshot of the health of the bay and the lands leading into it. The intent of the NERRS, it seems to me, is to provide support to the activities that the community already engages in. When I looked at the other NERRS across the country, a number of them supported fishing tournaments. That was one of the activities they did. So if you want to promote fishing, get in there, get in the management council early on and tell the people
MR. HECKMAN CONT'D	what you want. Make it so. Oahu is still growing. Although I work in Kaneohe and I've only been in Hawaii about 25 some years, but my wife is the one that got me here. I live in Kailua, and the sudden influx of visitors to Lanikai and Kailua beaches, the busloads of visitors over the last couple years without preplanning or thought, it's both impressive and it's rather scary. Could this happen in Kaneohe Bay? Sure. If there is not a clear vision and clear commitment to making the bay the highest quality possible and if we don't make it clear that there are people keeping track of what's going on in the bay, it can happen. So here is one more tool for the community to utilize, to take the pulse of one slice of the bay, to provide a training ground for our windward students. We all hear report after report of how things are going wrong, how the world's getting

MR. HECKMAN CONT'D	worse with global warming, fishery collapse. It goes on and on. Perhaps the most important thing is to figure out ways to make sure that our kids can imagine a world that they are headed into that will be a good place. The NERR site will provide a setting for our local students to learn how to utilize traditional and modern thinking and tools to create a future that they want to live in. So I'm in support.
MR. PHILIBOTTE	Aloha, everyone. My name is Jason Philibotte. I've lived in Hawaii for 10 years now, but I think I want to bring a different perspective to this. I'm in support of the NERRS. And, actually, I pretty much owe everything that I've learned about the ocean to
MR. PHILIBOTTE CONT'D	actually living on a NERRS. I'm originally from Massachusetts. I grew up on Waquoit Bay, which is a NERRS designation, and this is where I learned how to fish. This is where I learned how to sail. This is where I learned how to snorkel, water-ski. Any activities that had to do with the water, this is where I learned it. Not only did I learn these things, but as a graduate student when I went to college, I came back to Waquoit Bay and I did some of my graduate research there looking at the lifecycle of young fish and how they came in and used the estuary and how they were being affected by nutrients. This really helped shape who I am and what I'm here for today. You know, now that I'm in Hawaii, I'm working on seafood security issues. I'm working in partnership with Paepae, with Kapoho, and I don't think that I would be here and be doing these things if it wasn't the opportunity that I had growing up on a NERRS. So now that I'm here in Hawaii, it's my hope that when I have children, they'll be able to have the same opportunity, the same opportunity that all of you have as well. So I think that's why I'm in support of this. Thank you.
MR. MEYERS	Mahalo for letting me talk. Good evening, neighbors friends, family. My name is Steven Meyers. I'm born and raised in He'eia ahupua'a on the water. I have seen the changes over the years. I have seen the stewardship of our state just decimate our bay. I have seen Coconut Island, who I've got my niece-in-law and my sister-in-law, my cousin's children go through the program. I love the program. I've spent many hours -- I kissed my first girl on Coconut Island playing spin the bottle when I was a kid. I've been there and I've seen in front of my house turn from a vibrant, white sands, pristine koawan (phonetic) with live reefs and kole and o'opu and everything coming in, and I've seen just throughout my life the demise of the bay through the stewardship of the people in charge right now. I'm very leery about NERRS because, well, for one, I didn't get much input on your program, your foundation, and I hear beautiful things about it, and then I hear detrimental things about it. And I think for us to come up with some kind of conclusion on voting on whether you're going to be in for the next 5, 10, 50 years, it demands more introspection and inspection.
MR. MEYERS CONT'D	So I cannot put forth my granting this to be something that's going to happen in my backyard. I know that we have many issues in Hawaii, and a lot of them you aren't concerned with or do you recognize or understand. I know this watershed here, this whole wetland that you're going to be taking charge of, so to speak, you know, the waters of Hawaii are in public trust and that's for the public good, so they can have food security, Mr. Philibotte. And I think that they're giving up generations living here respective of the aina, respective of the practices that know much better than our DLNR lead people, our state lead people, and I -- and looking throughout my life in the past history of what I saw once to be a very vibrant bay turned into a mud pit, it doesn't give me much confidence to back anything that they're trying to shove down my throat. And I literally say trying to shove down my throat. I'm surrounded by your red wine studagry (sic), and I can't justify, you know, putting another weight around my neck or allowing you to have authority over that weight, you know. I think our little auntie over here, she's concerned for the Native Hawaiians and the taro farming and this and that.

MR. MEYERS CONT'D	I think that's beautiful. I think we should open up all those lands there and have community, family farming. Many of us here in Hawaii -- Kaneohe here has been the fastest growing town in this island chain for many decades, and many people here that were brought up -- My mother, born and raised Kaneohe, she graduated from Benjamin Parker High School. It was a farming community back then. You know, she was lucky if she could jump on a water-buffalo-pulled cart to get to Benjamin Parker from her house. Her mother, you know, she worked for Kaneohe Ranch. She planted a lot of the big Norfolk trees you see at Castle Junction up there on the hillside, you know, to pay her rent, and then at night, she'd make tofu and walk it down to Kahalu'u and sell blocks of tofu. You know, we're talking about teaching the young generation, the keiki. Well, I'll tell you what, they taught my mother this kind of stuff and they took advantage of her and her upbringing here, and now, you know, we're going to what, you know, manipulate some young innocent minds to, you know, some more abuse? I think what we've gotta do is listen to this middle generation here on thoughts and really be given the proper amount of time to decide what avenue to take that would be best. You know, if we're really truly concerned with the bay, I think the real root of the bay right now is the lack of freshwater that we get in the bay. Everything is being diverted down to water golf courses in Hawaii Kai and what have you, and the streams that are constricted with the concrete boundaries in the bay now. I used to see right across right here just inside of He'eia and Coconut Island – Okay. I appreciate you giving me the chance, and I hope better judgment besets upon all of our shoulders because what has happened and what might be happening in the near future is on our shoulders to give to our next generation. Thank you. God bless.
MR. INOUYE	Hello. My name is Russ Inouye. I run He'eia Pier General Store and Deli. I'm friends with everybody here. I listen to all the uncles every morning. You hear different stories. His father was like a father to me that taught me a lot about fishing in the bay. You hear about back in the day things and what used to be, what can be or what we will never see anymore and my kids especially, you know. So I love the tako, but Kako O Oiwi and Paepae have their plans and things like that, and I also understand the mistrust that the uncles have that I hear at the pier every morning why they don't like that, why they're afraid of it. I understand why Kelvin --
MR. INOUYE CONT'D	I'm friends with Kelvin too. -- like why there's mistrust and the things that come out. What I really want to know is if we can designate the area and support the NERRS, how come we cannot simply say that there's a guarantee that fishing and diving won't be shut down? Plain and simple. Common sense is how I was raised. You tell the community and you put it in writing, "1,000 years from now, there's still going to be fishing and diving," you're going to get support from the uncles because they all are family members and support these guys. So I don't understand why it cannot be put down black and white, "Fishing and diving guaranteed never going to shut down in the bay." Support the NEERS, we support them. Why is it so hard? I am for the NERRS with the guarantee that the bay will not get shut down for fishing and diving.
MR. ITO	Aloha. My name is Wally Ito, and my interest and passion is limu. So I grow limu for restoration purposes. I educate myself about limu, and I work with Uncle Henry Chang Wo to pass on our knowledge about limu. So anybody who want to talk story about limu, you know, come talk story. So when I heard about this NERRS designation, you know, good stuff, the internet. You can find a lot of information, and one of the things that, you know, and somebody can correct me if I'm wrong, but as far as being designated a NERRS system, the federal government provides no control. They said nothing about how you're going to manage a fishery. What they do say is that once the area is established as a NERRS, then it's the state's responsibility to designate, you know, the fishery management. So all of this mana'o about fishing and it going to take away my fishing rights, you know, I agree. I'm a fisherman. I'm a diver. I've been diving for 50 years. I want to be able to dive too, yeah? I want to be able to continue diving, but this is not the forum for that part of the conversation. Once we establish, if this NERRS is established, then the state is going to have to hold the same type of open hearing to get – you know, to establish how we're going to use it and how we're going -- what kind of rules. And the state -- we heard as far as the state is concerned about the NERRS area, they can
MR. ITO CONT'D	do anything from zero, you know, no take to no control. You guys can do anything you want all the way. I'm talking downrange, but that has to be established by the state after we establish the NERRS. One more point about, you know, there was a slight mention about the ecology of the estuary system. I just want to make a point that the estuary is like a nursery, yeah, for the marine environment, but not only marine environment, but all your waters mauka. There was a lot of – you know, the hihiwai, o'opu, opae, there's been lot of their lifecycle in the muliwai and in the area right around the estuary. So if we can preserve, restore the estuary, you know, you're going to get more fish. You're going to get more hihiwai, more opae mauka. So I think this is a very important designation. I'm 100 percent in support.

MS. KAPUA KAWELO	Aloha. My name is Kapua Kawelo. I'm Hiilei's sister, not that it's a mystery. I just have a few thoughts about this designation relative to my family's long-standing history with the bay, using the bay. My dad is a fisherman. My grandpa was a fisherman. His grandpa was a fisherman. I mean, there's many generations using this bay. So the last thing we want to do is see the bay become a place that people cannot use. That being said, I think that it's worth some serious recognition on the part of this community that Kaneohe Bay is broke, yeah? You don't see fish like you're supposed to see out there of the days of old; right? Full hukilau nets. You don't see top predators, you know, hunting all these wonderful schools of bay fish. You're not seeing that because it is broken. It is unhealthy. It is our kuleana as a community to step into this discussion. As you guys said, I read. DLNR is not doing what they should be doing. They are going to be a partner in this process. This is an opportunity for us to restore a watershed from mauka to makai. This is an opportunity that we can't pass up. It gives support to the groups that are already doing wonderful things out there and they can't do it alone.
MS. KAPUA KAWELO CONT'D	We can't solve this by only addressing the upland challenges; right? The threats don't just include -- Everybody in all these meetings I've ever been to is pointing fingers at everybody else. All these factors, alien species, limu, overfishing, unsustainable fishing practices, pollution, erosion, water, lack of water going to the system, these are all things we have to do research on because until we get the foundation to understand what's really happening, we're just -- we're just spinning our wheels; right? We're not -- we cannot try to solve these problems without having better understanding, and if we cannot trust anybody, how can we trust anybody more than the people who are putting in this application? Like I ask you that. These people are working their blood, sweat and tears in our community. Not just my sister, but Kako O Oiwi, all these people, this is what they do because they love it, they believe in it and they want to see their -- this resource preserved for future generations.
MS. KAPUA KAWELO CONT'D	And I think, you know, it's pilau if we cannot see that and open our eyes. We all live on the bay. We know this resource and it's time for this NERRS designation. I think it will give recognition and financial support for the organizations that already do so much for our community and give back to our community, and the days of, you know, standing back and waiting for things to happen are over. We just grab the wheel and we say this is what we want to learn. This is what we want to understand. Give us funding for this and do it. And that's -- that's my mana'o. I don't work every day with these guys, but I volunteer with all of them. What they do is amazing. I want my keiki to see fish. I want my keiki to be able to gather from this resource that their papa gathered from, that his papa gathered from, and tutus and kanes way before that. And if it that's not available for my kids and for their kids, then what have I done in my lifetime; right? So that's my mana'o. Mahalo.
MS. CAMVEL	Aloha. It's me again. Anyway, I just have another suggestion. When we look at the ahupua'a and we're sort of addressing it, think about it like an archaeologist. We're making it all discontiguous when really it's just one whole system's approach. So I would like to suggest that we consider expanding the boundaries to the entire ahupua'a of He'eia. I know everybody might go, "Hah? What you talking about?" But it's probably better than trying to go after a special management district with DLNR where you're involved with we have what we have in our ahupua'a a plethora of multi-jurisdictional multi-agencies that we have to deal with.
MS. CAMVEL CONT'D	I think that if we consider a boundary as a whole system's approach to ecological revival and restoration, we cannot separate the two. Part of the problem I have in my current research is that, you know, we're only focusing on the coastal. Kapua said, you know, too much on the uppers, but in truth, it really requires us to address the entire system because what happens at the top of
MS. CAMVEL CONT'D	Iolika'a (phonetic) Stream where I'm at totally affects the muliwai down here. So my suggestion is, you know, maybe phasing in or I don't know how that works, and, you know, that might be biting off more than you can chew, but I also think that this is an opportunity to take a whole system's approach on a particular ahupua'a. In 1998 when we first started, that's what we wanted to do, the whole thing. People were like, "Hey? No way you can do that." So I think if you think about it that way, it's like what can we do as a community all working together to restore food; right? Because that's what we should be thinking about. Food, food. So that's all.

MR. REPPUN	Charlie Reppun. I just have a question. Why does the upper boundary end at Kahekili Highway? Why doesn't the boundary include -- if it's an estuarine system, you gotta include the source of the water and there's no housing there. Why doesn't it go to the top? It should go -- it should include the entire source of water.
MR. FRAIOLA	Aloha mai kakou. Kauaoa Makaua Fraiola. I know plenty you guys, Hiilei, Kako O Oiwi, Paepae O He'eia, Rocky, Charlie. But, anyway, I don't belong to any of their organizations, but I do – I really respect the work that they do, especially, you know, all the guys that are on the proposal like Paepae O He'eia and Kako O Oiwi and HIMB. I really like what they do out there. I think they are good people trying to do something good for our bay and our community, and I support the NERR. I think it's an opportunity to bring in some resources and do some good things, but I -- I also am a fisherman and I grew up fishing in the bay. I don't have as many generations of fishermen as a lot of the people here. I can't pass several fingers on them, but I love the bay just as much. I understand people's concerns, and, you know, I don't know hat's going to happen, but I think it's a good opportunity to eventually to do something awesome. And I think -- you know, I heard a lot about this opportunity like maybe expand it throughout He'eia, make it bigger in the ahupua'a and kind of create an ahupua'a reserve, I guess, so to speak. But coming from a different ahupua'a in the bay, Waiahole, and like Hiilei echoed, there's a connection between the stewards. They don't really stand alone; that only they can thrive on it together.
MR. FRAIOLA CONT'D	And I think, you know, maybe there was talk of like expanding the opportunities. I mean, I don't know if it's going to be restrictive or not, but I think of it as an opportunity, an expanding opportunity to the rest of the ahupua'a ohana, the ahupua'a as ohana together helping each other. Then maybe it will be good to have some ahupua'a that have estuaries that are still pretty functional with less restoration needed, but maybe that can serve as benchmarks or targets and that can also open up opportunity to, you know, give a chance for these great organizations like Paepae O He'eia and Kako O Oiwi to lend their mana'o and experience doing education with the communities to our other ahupua'a that probably would like to start that, but maybe don't
MR. FRAIOLA CONT'D	know where to begin. You know, a lot of them are much, much smaller than He'eia with less the brainpower that can be spent towards these kinds of activities. In Waiahole a lot more people are farming and fishing and stuff and they could use a little bit of mentoring maybe. I think if I like to add anything else to this besides my sport, something different is that there's an opportunity for us to work together as a bay, and I'd like to see these kinds of educational -- I see it more than just research, but this is educational opportunity, opportunity to engage the rest of the community. I'd like to see those opportunities like -- I'd like to see something in the plan that engages the networks specifically and to be down and say, "Okay. Look, as part of our goal is to do outreach to other ahupua'a, to do educational opportunities there and --" I'm really nervous. I can't even remember what I said. I don't usually get up and speak in front of people. I usually just stay in the background. So that's my mana'o. Mahalo.
MS. ROBERTS	Hi. Thank you for letting me speak.My name is Ceil Roberts. I'm a relative newcomer. I have only lived in He'eia for 20 years. I started out on the mud flat right next to the fishpond. I have a great connection to this. I won't go into it, but if you look at the map or the
MS. ROBERTS CONT'D	picture, it shows us what we're talking about. We are unique within the United States. Puerto Rico is not a state. We are. We have the only tropical coral estuarine environment of all of them. We have an opportunity here that nobody else has. We already have HIMB and all the research being done on the reef by the scientists there. We already have a Hawaiian fishpond, a functioning Hawaiian fishpond. Nobody else has anything like the fishponds in Hawaii. And we have the mauka side. Even though we don't go all the way up to the ridge, we have a large part of the ahupua'a. Think about it. We have an opportunity nobody else has. So I am very much in favor as a 20-year newcomer of putting in this NERR. Thank you.
MR. CHAFFIN	My name is Mike Chaffin, 30 years here just across the road. We don't live on the bay, but we live on the wetlands that are behind our house. I just got a comment for against because I don't quite understand what's coming at us. I just don't think there's enough detail there, and maybe that's an inevitable part of this because each NERR is different, but I would have a cautionary comment to make. We all have electricity. How many of you

MR. CHAFFIN CONT'D	have any idea what went on in the last regulatory hearing or the last public hearing for HECO? These things tend to get ahead of us and get away from us so we get back to our lives. If this many people show up each time NERR or the state offers an opportunity to comment, I would be very optimistic. If, as is so often the case, we get busy or we get pulled back into our busy lives, it will gravitate to a few people with very specific goals and agenda, which may be good, may be bad, may be indifferent. I cannot say at this point, obviously, but if you're going to turn, you have the responsibility for the maintenance of this area. We've been here 30 years, by the way, I
MR. CHAFFIN CONT'D	should add. My children are raised here. My grandchildren will be raised here. If we're going to turn that over to government entities, we run it as a partnership, but the government is always there. The partners may or may not be. I would suggest we think about the post office and the IRS and the VA and so on and so forth. The goals are good. The ideals are indeed ideal. The reality is sometimes a whole lot less than we expect because we don't stay involved. So if you support this system or if you don't support this system, every meeting that is held for the benefit of the public ought to look like this or even more so. If it does, then I have confidence of what will come of it is good. I may not agree with all of it. You may not agree with all of it, but it will be a consensus in the community that works for the good of the community. If, as is so often the case, these meetings atrophy to a few officials that show up and a few zealots, if you will, then it may be something that we turn out not to like so very much. What was described in the Northeast sounded very ideal to me. I could get behind that. I just hope we have the will and the energy to maintain our current commitment and maintain it going forward to observe, participate and to modify and to build an organization or a plan that really makes sense for the community as a whole.
MR. FUKUMITSU	Good evening. My name is Keoki Fukumitsu. I was trying to stay quiet in my corner over there. This is kind of relevant because I was just putting a fishery proposal together to submit before the state, and I was on-line looking for some information and then I got wind of this project that was going on. So I'm real interested. I think that, you know, definitely, the impact of Kaneohe Bay speaks for itself already, and I like the fact that the ahupua'a system with the buffer zone going on, the watershed management, the ecology, environment, and most of all, I was looking at the opportunity for my own kids. If you come down to -- I'm from Waiahole-Waikane, Hakipu'u Valley, and this is where my program that I've been proposing is going to be generated. Of course, we have nine ahupua'a that enter into Kaneohe Bay. So Kaneohe Bay has always been like the source. Everything enters into there. All the resources enter into there, and you can tell the way how things are changing because it's pretty dormant.
MR. FUKUMITSU CONT'D	Anyway, I was looking at getting the kids into getting into like the hatchery, the nursery, you know, running the reefs, the Coastal Zone Management, the Ocean Resource Management, the county plan on sustainability on Ko'olaupoko, and looking at job opportunities so my kids -- I've personally got 11 grandchildren. I would love to see them, you know, picking up some he'e alongside the scientists and getting more information and stuff like that. I know it's pretty delicate because a lot of times the scientists can take the credit and run with it. So, of course, the people are going to be cautious. But then we should begin to use those things to train our kids to utilize these resources in a sanctuary, and it all has to do with the whole Kaneohe Bay. You know, all these nine ahupua'as, they all link up. Without this water management, it doesn't develop into the Ocean Resource Management unless we make a complete ahupua'a kind of a program. But for me, education always leads to more opportunity so that -- You know, what I recognize a lot in the bay or in fishing is that those whose lifestyle depended on fishing, even though their jobs were not sufficient enough they could rely on fishing and at the same time, the grassroots guys can go fishing. So it's a balance of their survival at this moment. So I'm just kind of watching and looking and seeing the pros and the cons of what's going on in this kind of community meeting, so I myself know where to make my move as far as teaching our kids the mauka-makai. And I'm talking like Kahalu'u Elementary School, Waiahole Elementary School and Kaaawa Elementary School. And, you know, instead of our kids learning about fishing, they're learning more about McDonald's. So, you know, and then all the way on up, instead of overcatching the fish, overfishing, learning to give back. So I think one of the comments I had is giving back. We only know how to catch the fish. So we have to know how to plant the fish and it starts the mauka-makai. Anyway, I just thank you for the opportunity.

MS. RUMPUNGWORN	Hello. As everyone knows, I just kind of walked in. My name is Madori Rumpungworn. Oh, that's for you. R-u-m-p-u-n-g-w-o-r-n. I just walked in. I just quickly glanced at what you guys had for presentation today. I didn't see all of it. Sorry. But I am a natural scientist student at the university, and I would say the least we have grave concerns for the ecology and the water resources here, and I hope that we not only include the wellness of the water and the land that's around us and that we live on and nourish ourselves with, but also the social aspect because sometimes people suffer as well. Again, I wish I had more to comment on the actual material, but I really hope to be a part of like what we can do to help change it. We have a sustainability summit coming up in a few weeks, and if some of you key members are interested, please come by because we need to start doing more things than getting reusable cups because sustainability isn't just about recycling. It's about a lifestyle.
MS. LEONARDI	I sort of waited for last minute. It was a strategy of mine. The last time I was here, I spoke, and I thank all of you for giving me the welcome here. I'm actually from Waianae. My name is Luwella Leonardi. I also grew up in Waimanalo. My mo'okuauhau is from here. I'm a thousand years here. I can go back to my kuleana and I can show you where my kupunas are still underground in our backyard. I came here tonight with some tools because I knew through -- because Hawaii is like that with ethnicity, ethno, because we're sentimental. We want something positive. We want to give our children something. We want to go to the shopping center and give them something. This is where we are. But when it comes down to
MS. LEONARDI CONT'D	masonry, my family were one of those people that went to the rock quarry and prepared 4,000 pohakus to build a church here in Kaneohe. That's my ohana when it comes down to the work itself, the hard work, when it comes down to looking at our aina from where our spirits are. I came last time to talk about public law 95-341. What is that? That gives me access from mountain to sea under the U.S. law. Okay? I do access here at Nuuanu at 4:00 o'clock in the morning. I do access at 4:00 o'clock in the morning at Mokapu. So I wanted to make sure that
MS. LEONARDI CONT'D	NERRS understands public law 95-341 and not just flip me off. Am I still on? Okay. So that's the reason why I came. And then I was listening to everyone else's mana'o, and I just want to sayNERRS understands public law 95-341 and not just flip me off. Am I still on? Okay. So that's the reason why I came. And then I was listening to everyone else's mana'o, and I just want to say coming from Waimanalo, Sea Life Park, you know, Sea Life Park where it's built was a heiau. Today it has a church on it for weddings, for Japanese people to come and get married there or anyone who wants to get married. That's what had happened to us. That's what had happened to our culture. Okay? So I prepared this. First of all, this is the Muliwai song right there. So I'm on task, yes? Okay? On the other side is Aloha Oe. So I'm still on task; right? And in it, it says, "Thou sweet rose of Maunawili and aloha oe," in the third verse. You can go to my dad's yard. We're still growing that exact rose that the queen talks about in her -- in her Aloha Oe song.

MS. LEONARDI CONT'D	Okay. On the other side, McAllister scientist came here. Over here is a picture at the bottom, Makai Pier right at the top. They're standing on the koa. That's Edward Ni'aupi'o. That is my grandfather's brother. Okay? And he's showing McAllister, the scientist, what our koa is about, but today we have Makai Pier on it. Okay. On the next page, my tutu-man go around and show McAllister and Handy all the heiaus in He'eia. Are we preserving that in our -- in our thoughts tonight? I don't think so. Sites of Oahu, you can go to page 244 and you can read my tutu-man's testimony there, Edward Ni'aupi'o, on Sites of Oahu. That's written by -- I mean, interviewed by Handy, by the way. Okay. And then the other side, Handy talks about -- asks my tutu-man about all the taro patches, and he makes my tutu-man out to be ignorant. He says he doesn't have memory to give him all the names of where the streams are and who owns the taro patches, but I know how my tutu-man was thinking. He's saying, "Oh, I going to give him all the names and all the streams, and they're going to come and aihue." That's why my tutu-man didn't tell him the names. Okay. So -- So these materials I brought because I knew tonight -- I took a tally up the ayes and the noes, and I felt that tonight is final. Okay, He'eia, people who live here? I felt that it was final. Actually, I got that at the last meeting when the governor said "usage." Okay. When it comes down to usage, I don't know if you heard that word, "usage." How many of you heard the word "usage" out of the governor's mouth? Okay. The only usage we have of Hawaiian usage is for water. It's in your Hawaii Revised Statutes. Okay. You need to know that. That's where our usage is water. Are you going to hold onto your water rights? Are you going – through the NERRS, or are you going to give it up to the common ground? Okay? So it's up to you folks. I'm asked to be wrapped up in two minutes. That's why I put this together so I no can go on and on and on. I also teach. I teach every day five days a week and on the weekends. So I teach our children what hydrological cycle is, and I take them outside and I show them how it works.
MS. LEONARDI CONT'D	So right now out in Waianae -- Wait, wait. Let me tell you one more thing. I have two maps to make sure that the scientists in this room know the boundaries of our ahupua'a. One was given to me by Don Mitchell. Okay? And I brought two maps of the same map. One was done in 1913 and the other one was done in 1929. Why I would do that? Because I want you to know where is Ko'olaupoko and Ko'olauloa. Ko'olauloa is on the side of Ko'olaupoko. So did we hear all these different ahupua'a voices, or are we just hearing the different group leaders here? So there's one here and then there's another one here. I wanted to make sure that this was done. The other thing that I heard last week is that this is the second meeting or that was the first meeting. A'ole, people. 2,019, us from Waianae, this is how many meetings we had statewide from CZM. This is a lot of work for the whole 2013. I am not here for just a second time. Okay. So the CZM meeting, we talked. We came through. We met with the groups. We went with the Stratton (phonetic) report. I talked to Tom over and over. He's on my iPod, and I talk to him all the time. I have meetings with him about CZM. Go to the map. Look at the 28 or 29 listings on that in the back of the maps. Go on your internet. Look for those areas. Look for how many suits going on. The environmental is suing the NERRS. Look for those things. Find out why. The reason why the high court does not send -- you lose in high court is because it's for the good of the public and because policy is set -- sets the rules, and if the state is going according to the rules, then it's set. If the business community is going to sell some of the -- a part of the thousand acres, you got no choice. It's going to be gone. Reusable energy -- if a corporation come here with reusable energy, it's gone. You have nothing to do. You cannot --You cannot have Hawaii usage. Renewable energy is owned by corporations like HECO. They do that in Waianae and they do that Waimanalo. Mostly in Waianae. Come out to Waianae. My main concern is my Hawaiian people, our kanakas, what happens here, this is the bottom line to our kanakas. They go out with their fishing nets or their slings, and it all gets taken away and then they get a citation, and they don't know how to go to court because it's in Kapolei. Before you know it, they got a warrant. Before you know it, they're in jail. This is where the maka'ainana in He'eia is going to go. And that is the bottom line.
MR. MEYERS	Thank you so much. And I know. And if I can apologize, I know myself you folks come here and you don't understand why there's so much emotionally charged issues here.

MR. MEYERS CONT'D	It's because we the little people of the state, so to speak, had been kind of overrun and ignored, and that's why we're just now trying to set some kind of, you know, parameters for our own neighborhoods. And I know it's completely -- You know, some of these topics are outside of your realm of understanding. What I would like to do is say to him over there, I came over to his side of the bay and I got some opae to replace mine on my side of the bay, but I never asked you guys permission and I'm sorry for that. But I get opae on my side of the bay, I come back and put it back in Hakipu'u. Okay. See, that's how we do business. Each and every ahupua'a, we ask permission to enter and, you know, explain what we are doing when we go inside their backyard, and that's what the local people are used to doing, to be neighborly with one another, and a lot of the state politics and federal politics, they don't have that kind of understanding. They just come in and say, "Move over. We're doing this." And that's why you're feeling so much pent-up emotions over here. I've got a couple -- I know folks out in Coconut Island and you guys want to just benefit the world and make everything better, but in my own history watching you, being a neighbor of you, you know, I've seen you acclimate tilapias to be saltwater fish, and then you let them loose in the bay. Now they're all over in front of my house eating the natural indigenous fish. Okay. And, you know, the ogo, the invasive species of seaweed, that was brought in and granted permission by the state through UH and through commercial entities. Am I wrong? Okay. Oh, not HIMB. They were granted permission, and, you know, the commercial entity fell apart and dissolved, and now we've got this huge problem to deal with. And that's what happens when the community isn't involved, and that's why you have so much charged issues about what's happening, you know. He'eia ahupua'a, I watch the guys in Safeway. They've got the guys that come in and scrub and chemically clean their floors, and they pour it in buckets and they go right outside and dump it into the parking lot which drains right into the bay. And mahalo for listening to me. I'm sorry if I offended anyone.
AUDIENCE MEMBER	At what point do the boundaries get finalized?
MR. MEYERS:	Excuse me. We need NOAA's approval or do we have the approval of the community? Does that make a difference? I thought we, the ommunity, that was our -- input is what approves or disapproves it. So when do we have that say so?
MS. LEONARDI	Okay. I have a question, and the question is how many acres is that because I -- Yes. It's over a thousand. There's a breakdown. And then 18 because the numbers doesn't add up. All of you can call the number and get the acreage, and I think you need to do that because it's already keyed in as to how many acreage per land use and ocean use.

Dated: November 18, 2014.

Glenna Mickelson,

Management Analyst, Office of the Chief Information Officer.

[FR Doc. 2014–27647 Filed 11–21–14; 8:45 am]

BILLING CODE 3510–JE–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Intent To Prepare a Draft Environmental Impact Statement for the Proposed He'eia National Estuarine Research Reserve in Kane'ohe Bay, Hawai'i

AGENCY: National Estuarine Research Reserve System, Office for Coastal Management, National Ocean Service, National Oceanic and Atmospheric Administration, Department of Commerce.

ACTION: Notice.

SUMMARY: In accordance with section 315 of the Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451–1466), the State of Hawai'i and the National Oceanic and Atmospheric Administration (NOAA) intend to conduct two public scoping meetings on December 17, 2014, in Kane'ohe, Hawai'i, and on December 19, 2014, in Honolulu, Hawai'i, as part of NOAA's draft environmental impact statement (DEIS) and draft management plan (DMP) process to solicit comments for the preparation of a DEIS and DMP on the Proposed He'eia National Estuarine Research Reserve in Kane'ohe Bay.

DATES: December 17, 2014, at 5:00–7:00 p.m. and December 19, 2014, at 5:00–7:00 p.m.

ADDRESSES: December 17 at the King Intermediate School, 46–155 Kamehameha Hwy., Kane'ohe, HI 96744 and December 19 at the NOAA Fisheries Honolulu Service Center, 1139 N. Nimitz Hwy., Ste 220, Honolulu, HI 96817.

FOR FURTHER INFORMATION CONTACT: Contact Rebecka Arbin, Hawai'i Office of Planning, P. O. Box 2359, Honolulu, HI 96804 at (808)587–2831 or *rebecka.j.arbin@dbedt.hawaii.gov* or Joelle Gore, Acting Chief, Stewardship Division, Office for Coastal Management, National Ocean Service, NOAA, 1305 East-West Highway, Silver Spring, Maryland 20910, at (301) 713–3155 ext. 177, or *Hawaii.nerr.comments@noaa.gov.*

SUPPLEMENTARY INFORMATION: The decision to be made by NOAA is whether to designate the proposed He'eia National Estuarine Research Reserve. The State of Hawai'i, through its Office of Planning, site partners and NOAA are working to determine the boundaries of the reserve, how the reserve would be managed, and the policies of the proposed reserve. These decisions will be made through an analysis process and described in the reserve management plan.

Found within the largest sheltered bay in the Hawaiian Islands, the He'eia estuary constitutes a range of diverse habitats, including uplands, wetland, and fringing coral reefs, and is representative of the estuarine habitats in the Insular biogeographic region. In addition, the site hosts numerous traditional Hawaiian practices, including an ancient Hawaiian fish pond and taro cultivation. The combination of unique traditional Hawaiian land uses and natural habitats is expected to attract a broad range of research interests from multiple scientific disciplines. In July 2012, the Governor of Hawai'i sent NOAA a letter of interest in exploring the feasibility of designating a reserve within the Hawaiian Islands based on ongoing conversations with community groups and the University of Hawai'i. In February 2013, the State of Hawai'i undertook a site selection process to determine appropriate areas of the Hawaiian Islands that might be nominated for inclusion in the reserve System. Hawai'i, working with scientists, community organizations, and the public, gathered input and suggestions to inform the selection of a potential site for consideration as a national estuarine research reserve.

On May 21, 2014, the Governor of the State of Hawai'i nominated the He'eia estuary for consideration as a Hawai'i reserve. On October 27, 2014, NOAA accepted the site nomination document for the proposed He'eia reserve and initiated planning efforts with the Hawai'i Office of Planning HIMB.

The He'eia reserve is proposed to be administered by the State of Hawaii in cooperation with the Hawaii Office of Planning, the Hawai'i Department of Land and Natural Resources, the University of Hawai'i, Hawai'i Community Development Authority, and community organizations Kako'o 'Ōiwi, Paepae o He'eia, Ko'olaupoko Hawaiian Civic Club, Kamaaina Kids, and The Nature Conservancy, with support from other state and county agencies and community members. The Hawai'i Office of Planning, in collaboration with those partners, is jointly developing an outline of a preliminary DMP. The outline is intended to identify specific needs and priorities related to research, education, and stewardship. At the public meetings, the Hawai'i Office of Planning and NOAA will provide a synopsis of the process for developing a DEIS and DMP and will solicit comments on the scope and the significant issues to be analyzed in a DEIS.

Interested parties who wish to submit suggestions or comments about the scope or content of the proposed DEIS and DMP are invited to attend the above meetings or provide comments to the Hawai'i Office of Planning or NOAA's Office for Coastal Management. Comments can be submitted to *Hawaii.nerr.comments@noaa.gov* or U.S. mail at the addresses listed below.

Federal Domestic Assistance Catalog Number 11.420 (Coastal Zone Management) Research Reserves

Dated: November 18, 2014.

Donna Rivelli,

Deputy Chief Financial Officer, National Ocean Service, National Oceanic and Atmospheric Administration.

[FR Doc. 2014–27729 Filed 11–21–14; 8:45 am]

BILLING CODE 3510–08–P

COMMODITY FUTURES TRADING COMMISSION

Agricultural Advisory Committee Meeting

AGENCY: Commodity Futures Trading Commission.

ACTION: Notice of meeting.

SUMMARY: The Commodity Futures Trading Commission (CFTC or Commission) announces that on December 9, 2014, from 10:00 a.m. to 3:00 p.m., the Agricultural Advisory Committee (AAC) will hold a public meeting at the CFTC's Washington, DC, headquarters. The meeting will focus on, among other issues, topics related to the agricultural economy, as well as the deliverable supplies of agricultural commodities as they pertain to position limits.

DATES: The meeting will be held on Tuesday, December 9, 2014 from 10:00 a.m. to 3:00 p.m. Members of the public who wish to submit written statements in connection with the meeting should submit them by December 1, 2014.

ADDRESSES: The meeting will take place in the first floor Conference Center at the Commission's headquarters, Three Lafayette Centre, 1155 21st Street NW., Washington, DC 20581. Written statements should be submitted to: Agricultural Advisory Committee, c/o Cory Claussen, Commodity Futures Trading Commission, Three Lafayette Centre, 1155 21st Street NW.,

Notice of Intent to Prepare Draft Environmental Impact Statement and the Management Plan for the

Proposed Heeia National Estuarine Research Reserve System (NERRS) in Kaneohe Bay, Hawaii

Notice is hereby given that the National Estuarine Research Reserve System, Office for Coastal Management, National Ocean Service, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce and the Hawaii Office of Planning, Hawaii Coastal Zone Management Program will hold two public scoping meetings to solicit comments on significant issues related to the preparation of a draft environmental impact statement (DEIS) and draft management plan (DMP) for the proposed Heeia National Estuarine Research Reserve in Kaneohe Bay, Hawaii. The DEIS and DMP will address the research, education, and stewardship needs of the proposed reserve.

DATE: December 17, 2014 at 5:00 - 7:00 pm at the King Intermediate School Dining Room, 46-155 Kamehameha Hwy, Kaneohe, HI 96744

December 19, 2014 at 5:00 - 7:00 pm at the NOAA Fisheries Honolulu Service Center, 1139 N. Nimitz Hwy., Ste. 220, Honolulu, HI 96817

Interested parties who wish to submit suggestions or comments about the scope or content of the proposed DEIS and DMP are invited to attend the above meetings or provide comments to the Hawaii Office of Planning or NOAA's Office for Coastal Management. Comments can be submitted to hawaii.nerr.comments@noaa.gov or U.S. mail at the addresses listed below.

FOR FURTHER INFORMATION CONTACT:

Rebecka Arbin, Hawaii Office of Planning, P.O. Box 2359, Honolulu, HI 96804, at (808) 587-2831 or rebecka.j.arbin@dbedt.hawaii.gov or Joelle Gore, Acting Chief, Stewardship Division, Office for Coastal Management, National Ocean Service, NOAA, 1305 East-West Highway, Silver Spring, MD 20910, at (301) 713-3155 ext. 177, or hawaii.nerr.comments@noaa.gov.

Persons with disabilities please contact Leo Asuncion at the Office of Planning, Coastal Zone Management Program by December 8, 2014 to make arrangements. Phone: (808) 587-2846

More information on the NERRS can be found at http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process.
(SA693047 11/26/14)

JOINT PUBLIC MEETING ON
NOTICE OF INTENT TO PREPARE DEIS AND MP FOR

PROPOSED HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM (NERRS) IN KĀNE‘OHE BAY, HAWAI‘I

AGENDA

Wednesday, December 17, 2014 at 5:00 p.m. – 7:00 p.m. at
King Intermediate School
46-155 Kamehameha Hwy., Kāne‘ohe, HI 96744

Friday, December 19, 2014 at 5:00 p.m. – 7:00 p.m. at
NOAA Fisheries Honolulu Service Center
1139 N. Nimitz Hwy., Ste. 220, Honolulu, HI 96817

5:00 – 5:15 Welcoming Remarks

1. **Mahalo for attending;**
2. **Opening Pule;**
3. **Introductions;**
4. **Project Overview and Purpose of the Meeting;**
5. **Logistics.**

5:15 – 5:45 Presentations

1. **Introduction of Presenters;**
2. **NOAA NEPA process;**
3. **OP Management Plan process;**
4. **Limited clarifying questions only.**

5:45 – 6:50 Public Comments

6:50 – 7:00 Closing Comments

He'eia NEER Public Scoping Meeting
December 17, 2014, 5:00 pm to 7:00 pm
King Intermediate School

Attendance Sheet

Name
Donna Camvel
Wali Camvel
Kelvin Ching
Michael Chung
Jim Cook
Mahealani Cypher
Dietrix Duhaylonsod
Peleke Flores
Donald E. Gentzler
Joanne Hiramatsu
Jerry Kaluhiwa
Rocky Kaluhiwa
Hi‘ilei Kawelo
Jarrett Keohokalole
Judy Lemus
Luwella Leonardi
Rusty Lillico
Tiffany Patrick
Keahi Piiohia
Susan Tamura
Ernest Theodore
Rob Toonen
Ikaika Wise
Ricardo Zanre

He'eia NEER Public Scoping Meeting
December 19, 2014, 5:00 pm to 7:00 pm
NOAA Fisheries Honolulu Service Center

Attendance Sheet

Name
Jerry Kaluhiwa
Rocky Kaluhiwa
Kristina Kekuewa
Luwella Leonardi
JoAnn Leong
Sean Martin
Michael Migliori
Ben Reder
Rob Toonen
Wendy Wiltse

Written Comment Form
Proposed He'eia National Estuarine Research Reserve in Kāne'ohe Bay, Hawai'i

Thank you for participating in the public scoping meeting to solicit comments on significant issues related to the preparation of a draft environmental impact statement (NEPA) document and draft management plan for the proposed He'eia National Estuarine Research Reserve System in Kāne'ohe, Hawai'i. We invite you to use this form to provide your comments. If you complete this form at today's meeting, you may leave it at the registration table as you exit. If you do not wish to complete your comments during this meeting, you may submit comments by any of the methods listed below.

1. E-mail: hawaii.nerr.comments@noaa.gov

2. U.S. mail:

Rebecka Arbin
Hawai'i Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Your input into this process is appreciated. If you wish to be notified of future developments, please check here [ ] and provide your name, mailing address and/or e-mail address below.

Name: FRED FLORES (AKA PELEKE)	Date: 12/17/14
Mailing Address:	E-Mail Address:

COMMENTS (Please continue on the back of this page as necessary)

EXTEND BOUNDRIES TO ORIGINAL BOUNDRIES, WE CAN MĀLAMA, ALOHA ĀINA, SUSTAINABILITY CULTURE AND FOOD RESOURCE.

FOR FURTHER INFORMATION CONTACT:
Rebecka Arbin, Hawaii Office of Planning, Phone (808) 587-2831, rebecka.j.arbin@dbedt.hawaii.gov or hawaii.nerr.comments@noaa.gov. Phone number listed is not a toll-free number. Please see http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process/ or http://www.nerrs.noaa.gov/ for more information.

Written Comment Form
Proposed He'eia National Estuarine Research Reserve in Kāne'ohe Bay, Hawai'i

Thank you for participating in the public scoping meeting to solicit comments on significant issues related to the preparation of a draft environmental impact statement (NEPA) document and draft management plan for the proposed He'eia National Estuarine Research Reserve System in Kāne'ohe, Hawai'i. We invite you to use this form to provide your comments. If you complete this form at today's meeting, you may leave it at the registration table as you exit. If you do not wish to complete your comments during this meeting, you may submit comments by any of the methods listed below.

1. E-mail: hawaii.nerr.comments@noaa.gov

2. U.S. mail:

Rebecka Arbin
Hawai'i Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Your input into this process is appreciated. If you wish to be notified of future developments, please check here [ ] and provide your name, mailing address and/or e-mail address below.

Name: KELVIN CHING	Date: 12/17/14
Mailing Address:	E-Mail Address:

COMMENTS (Please continue on the back of this page as necessary)

ATTRITION ~~MASTER~~ COMMERCIAL TOURIST OPERATIONS AS INTENDED ~~IN~~ IN MASTER PLAN.

FOR FURTHER INFORMATION CONTACT:
Rebecka Arbin, Hawaii Office of Planning, Phone (808) 587-2831, rebecka.j.arbin@dbedt.hawaii.gov or hawaii.nerr.comments@noaa.gov. Phone number listed is not a toll-free number. Please see http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process/ or http://www.nerrs.noaa.gov/ for more information.

Notes from
Public Mtg. 12.17.14

Ernie Theodore	My question is what made the Office of Planning determine the outline of the proposed boundary? I have a suggestion, all of the fisherman fish in this area here (points to the reefs throughout the proposed boundary), there's no fishing around Coconut island so, that would be a perfect place. Coral island is enforced by the military. They would come shooting off the zodiac in the estuary. See these boundary lines on the chart there, it was changed from the previous meeting, why is that? I see some of the boundary lines, doesn't it include conservation lands? Why? Also, the proposed boundary in the ocean, it includes certain reef patches. That's unnecessary. The previous chart included two patch reefs and stretched out to Coconut island for what? Research or whatever? We get two natural estuaries.
Michael Chung	I am a fisherman of Kāne'ohe Bay and the previous comment reflects my concern as well in regards to boundary lines being changed. I brought this up at the first meeting. It extended to the commercial operations here and nothing was going to change. Fisherman were going to be included in this area. If nothing is gonna change why did they exclude these commercial guys? You guys must've thought of excluding them would help right? Well, we're worried. Are fishermen going to be excluded? I mean I care about a lot of other stuff too. But, the issues the water. The water quality check is gonna be from present and you gotta include historical water quality info, but we no more. We don't have enough water because it's going to 'Ewa side. But if you give back the water to Kāne'ohe Bay a lot of the bait fish is gonna come back. There's only one aku boat out there and that boat is done. They're retiring. So you cannot blame them for less fish in the water. They used to have 20 aku boats. Now there's no water.
Kelvin Ching	I also grew up in the bay and have been involved in the bay issues when I was in college. I attended all the meetings especially with the Kāne'ohe Bay Master Plan and I am disappointed. This sounds like another go through the motions. This will probably be adopted because it has different motives. You want comments and input regarding your goals and aspirations. Ok, well first off if there are no new regulations, I'd like to be able to reference that when I tell my kids and grandkids about it. But, I know it's not gonna happen. This is the beginning of the end for us. Second, these partners in the management plan: who decides who the partners are? Can we be partners? By the time public comment is over everything is all said and done. I see you guys going back to the ahupua'a and that's not recognized today. It's not for one certain group, privatizing the ocean, that's not right. You're going back to old Hawaiian system. Would be good if everything was done the same way across the State. We can't live in the two worlds. You can't have State support and want to be sovereign. Also, where is the money

	coming from? It seems like we're doing the same thing and expecting different results. I'm sure there will be different results. What I wanna see is us to save time and money… let alone the money we don't have.
Donna Camvel	Aloha to everyone, I too am concerned about He'eia as it is a very special place. A lot of us have long time genealogy and various kuleana here. My question regarding the boundaries seems insignificant as so many of my other concerns have an effect on our current practitioners. I understand the reasoning too. Here, we are looking at new ways to manage resources that are severely impacted and will continue to be impacted especially now due to climate change. We cannot merely look towards next generation; it must start with us now. There are mo'o of this 'āina and we need to all work together. I'm aware of the concerns regarding trust with various agencies that have come here from across other lands and have done great harm. But we do live in a time that the ahupua'a framework is coming back. Here in He'eia we can say we have a real special place that still holds a lot of critical components regarding customary practices and science. There must be serious mitigation measures in terms of environmental impacts. As fishermen, I know there are changes in species and amount of fish. The abundance conditions are certainly observed for example at Ioleka'a. In terms of interests in the NERR project include that when we talk about ahupua'a we talk about a mauka to makai management system. For Kanaka Maoli and the local community this is a complex and interconnected system. While it may appear to be broken, components in each 'ili are alive. This includes the tangible and intangible. The way those things are managed must be place-specific kuleana. So when we look to fishermen for expertise, we have to pay attention to their concerns. When we look to farmers, their concerns also must be addressed. I would also like to see the inclusion of the 4 perennial streams: Haiku, Ioleka'a, He'eia, and Puolena. These streams run through the wetland and into bay. The muliwai must be productive in order for the reserve to work properly. We need to begin talking about managing resources in best way possible. However, we also can't leave mauka sections out of the reserve if we are going to do this properly. Waters that come from mauka are source waters that flow to the Bay. These streams go thru smaller ecosystems, and it is important on how they are managed and then the capacity they have to manage themselves. This is critical to this plan. I would also like to clarify that the idea of ahupua'a is not a watershed. A watershed says there's bunch of water and it all drains in same place. Ahupua'a is so

	much more. Everything in it is relational. Everything is bound by reciprocity and that includes the people who live in it. Cultural perspectives must be included while putting together this plan. You certainly have lots of volunteers in this room that have been a part of many volunteer efforts. See how we would like to remain in the loop. You may include streams yet, not the whole ʻili or the whole stream. We would like to see the streams evaluated, tested for components such as flow, groundwater, and turbidity. We would like to see studies regarding the drainage in the wetland. In terms of science, these elements can help answer those questions and explore the directions we should take. Yes, it is pretty hard to go national when you are going sovereign, but there is space for ʻāina. There must be a way for us to advocate for that right? I also have a few questions. Are these arbitrary boundaries? Can they change? Who said they could be changed? Answer these questions, and we will begin to establish trust. As long as our history remains, we will always be looking out for the best interest of the 'āina. I understand this can help reserve and preserve but it might happen to have long-term ramifications. However if it is written using a cultural lens, it might just work. Another suggestion. You see here where Haiku Stream in Haiku valley trace from the source, where the punawai starts, maybe go from the middle of the stream 5 feet on each side. That might also be a good boundary. Those waters flow thru wetland. Mahalo. `
Ms. Luwella Leonardi	Aloha I am Luwella Leonardi and I live in Waiʻanae. However I am the daughter of Edward Nīʻaupiʻo who was born in Maunawili. We are the mauka Nīʻaupiʻo. Under Sites of Oʻahu, under Waimānalo you'll find Edward Nīʻaupiʻo there. He was insulted throughout the Koʻolaupoko region. I'm opposed to this project. I don't have any theory; I can't talk theory and thesis. I'm not educational. I teach in the schools and the colleges. I know how to teach the children about the ocean in the classroom. I look at children every day. My question is where are these kids gonna live. Theyʻre not gonna have the opportunity to live in Hawaiʻi. I'm here to see that opportunity exists. This plan sort of carves our future generation out of Hawaiʻi. It does not embed our children into the future that our parents woke up to. I can't guarantee them that. I grew up in Waimānalo, before Sea life Park. It is appalling that we're creating another Sea Life Park. It took so much from my dad. When Chad Pryor showed up, he said, "Oh, we're going to feed the world." All that I can remember him doing was putting a wholphin and – a dolphin and a whale together and coming up with a wholphin. I got pictures of the wholphin. I thought he was cute. But did

	that feed the world? Later as an instructor I took students to Sea Life Park. The wholphin, two species together, to me that's appalling. When Makai Pier came up, that raped our resources. I remember when my father and grandfather's brother, okay? He showed McAllister, the scientist, what our ko'a is about, but today we have Makai Pier on it. Sea Life park was a heiau too, a lot of 'iwi buried there. They swept across like a plague. By the way read the Stratton Report. The only copy they have is in Hilo, used to have in Hamilton Library. What I've got from DLNR is that we don't have any authority and that scientists on west coast they have authority backed up by junk science. So I'm sitting here telling you 'a'ole, 'a'ole, 'a'ole, 'a'ole. That's what we say. We're still sovereign and we're occupied. So what we're looking at, if the game is going to court how much is this gonna cost us? And whose gonna carry the burden. It can end tonight on your comments.
Mahealani Cypher	I live in Kāne'ohe. Eō to some of the remarks made earlier especially by Donna Camvel in regards to finding the right balance for Kāne'ohe Bay. What I also heard, in moving forward is to include the voices of our fishermen. They need to be a part of this. It's not about a museum piece but the living pieces. We need to work together. We need to accept the help. What's the cause of problems, you know? I look forward to having the research done. I don't look to what's junk and I don't care where you come from. If you have the help than please help. I think it's rude to tell people to leave if they are offering help. Yes, we have been shifted out of balance for a hundred years. I don't see as many fish as there used to be over the last 10 years. There's a hope that through the years they are not meant to lock us out and hopefully ensure our future. The only way to do that is to stay engaged. Nobody should be outside the window. You guys are a part of this. And anyone who wants to be a part of the solution should be a part of the working group. Mahalo to everyone.
Jerry Kaluhiwa	Jerry Kaluhiwa. I'm from He'eia and born raised there. Before everyone talk about doing these areas I'd like know about the red line. I want to expand in the direction that won't be blocking no community. I'm talking about no community around so we don't have conflict with the community. It happens a lot. I've done research since the 60s with at-risk kids in the Key Project. That's how I got involved in high schools. We did a seaweed project with Ogo. On the Ogo part, I'm the only one that made seedlings. From that time on, I wanted to get deeper in my studies. I'm concerned about Kāne'ohe Bay. I caught it with my

	family. I know how to do it. Today, we don't show anyone that kind of fishing. Because not enough fish. I dive today; I go every day. These days the fish is too well educated, you gotta really think like one fish to catch one manini. We trying to find out why? Then I got into tropical fish. Tropical I see disappearing right from the earth. Some fish extinct. I ask fishermen, do you know what's happening? Today you don't see that kind of fish. I went to research on these tropical fish. It's coming back at least 1 or 2 I see. Makes my feelings good. We should look into it. Coral, now I went into corals trying to protect corals in front my place. I went to court and all that fighting is all in the air. Judge slapped those guys on the wrist, why? Because the judge don't know the rules. I try to protect Kāne'ohe Bay. I take tours out especially to see the tropical fish. When we go we feed fish, then there comes these crazy guys with net and they surround the whole place. When I go out again each time fish is getting less and less. Especially around Coconut Island. When I see people walking on the reef and saying they have rights. I know they were lying because I'm there and I know they not supposed to be doing that. It's the law. They should leave Coconut Island and use it as a restoration area. We did research there and it is excellent. Especially the limu Ogo. Now I have another project called Mauka Makai. We need to do a little more. We did Mauka Makai, had 6 members. Hi'ilei was one of them and several other people. Hi'ilei knows about it. We did that because I am also in the lo'i business. I helped build lo'i kalo in He'eia and I stayed doing that worked with Hi'ilei on the fishpond. In analyzing mauka, this boundary line needs to be moved more towards the blue mountain. We get rivers from Uncle Lono's place. We gotta research that. Next thing we looking at that to see how it affects the seaweed and the coral reefs.
Wali Camvel	I was born and raised in Kāne'ohe and have been here for 52 years. I swam at Ice Pond by Luluku side and have gone around Mōkapu. I've been from mauka to makai these hanabata places. Aunty you talk about Kanī'aupi'o. Kaupo where you from that's a good place too. I want to address where the Army Corps guys started dredging the bay. It changed the currents, and no more that wash that cleans it out. Maybe that part science can help clean out, circulate here. Here, these subdivisions, the mud goes right out into the bay. Now I hear people are afraid of doing stuff. If we don't do anything what are we going to do. If we just do nothing, what is our option? We can get together someplace else and actually do something. We have invasive species up mauka that goes into the stream, which goes into the bay. Several groups in Haiku are planting kalo and opening up streams Ioleka'a side, also the working being done at Paepae by the fishpond. Get involved, there are people actually doing something make this

	place better. He'eia is on the move, we not good yet but we doing something. What kind of future are we going to leave? My parents never do anything. If one hurricane came can you drink the water in the stream? I know we can. We stay up mauka. But, the H3 frees all that asbestos from all your tires go into the drains into the streams and into the bay. What can we do now? How can we control our community so that we can offer something later on? Neighbors spray Round Up that goes in the stream. They spray Round Up, goes on top the bees and kills the bees. What are we doing to better our community? We take care of the limu and we gonna get that fish. Sure, we cannot go back 100 years but if you think about 100 years, was not so long ago. We really mucked it up. I have memories when my sisters, they played in taro patches. For a long while He'eia wasn't producing any kalo. 1948 was the biggest production of kalo and after that slowly went downhill. Lo'i kalo allows for stream water to percolate and create water recharge. Board of Water calls em recharge units. The water, they go into the aquifer. If we do nothing now, then what are we going to do?
Rocky Kaluhiwa	Aloha kākou, I was born and raised He'eia all my life. I am a part of the Kāne'ohe Bay Regional Council. We have talked to the senators; we have 5 members. Kelvin, Maybe you should get back on that committee. What Wali and Donnie said is true; I used to drink that water, near their place. My 'ohana is from up that place. All my life we always maka'ala with He'eia because that is our ahupua'a. We have 11 'ili inside there. Rick Barboza them are back there. I also just like let you folks know that we are the partnerships that are actively sustaining these resources, it's all what we have. So, don't just come grumble. We invite you guys to come because we need your help. It is our kuleana and it is a kākou thing. You know we got little left. Look at our coral reefs and the depletion of fish. You're a fisherman, you can help on the board of fishermen. And you know what? Every time I hear He'eia I'm on top of it. Either you gonna help us or you gonna fight us, either way we invite you to help us.
Wali Camvel	For clarification, the ahupua'a of He'eia actually goes to the Marine Base. It's a good place to do studies because get plenty fish and not to mention the fishpond out there. There are several fishpond. Also get place for us to make salt.

Sean Martin	Hi, I live in Kahalu'u, and I am affected somewhat frequently. My place is very close to some of these boundaries. Going back to Leo's comment, regarding community engagement. He said that community engagement would be primarily based on landowners and the community within these respective areas. I think it's shallow. Users of the bay are not only from the windward side. Community involvement should be encouraged at a higher level other than the public comment period. For example, there are other interested parties that aren't engaged as landowners or users. It would be good if they had the opportunity to provide input. Another concern I have is regarding the layer of bureaucracy. I've been hearing that the Feds are not going to develop regulations. So it's clear that the State will allot the activities that are encouraged or prohibited in the designated area. I am cautious about that. The more you have public engagement the less hostility
Wendy Wiltse	I work for the EPA and I support the nomination of the He'eia for NERRS program. I think it's a positive thing for Hawai'i, for Kāne'ohe Bay and for Ko'olaupoko area. As far as the boundary, I recommend considering including more mauka land to have more of a complete ahupua'a system. The remainder of my comments relate to management. Some aspects of this area that I'd like to see considered in the EIS and the management plan include the following: first, the role of mangroves. I know that in general they're considered a nuisance but in my personal opinion they have important ecological function especially for filtering sediment. I think they're more effective than a native wetland. I'd recommend they evaluate the ecological function of mangroves. My second comment would be on the fishpond aquaculture and taro production. I think they're positive but they also could be negative. It depends on how they're operated and managed. For example, water quality studies we have done in Hanalei, the biggest taro producing region in the state, we have found that the lo'i export nutrients and sediments. Although we do not have the data, we suspect the lo'i also export pesticides. How the taro is managed needs to be considered as well. I wouldn't want to see a major nutrient export from these lo'i into the bay. In addition, fishponds and the way they are managed is also a concern. Well, like the lo'i it depends, will the fish be fed? What's the population density? Is there a potential for exporting nutrients from fertilizers and fish feed? We already have eutrophic conditions in the bay, especially with the algae blooms due to nutrient exports. Finally, the plan should consider herbivore fishery management. It's something that DAR is doing on Maui with some success. There's lots of scientific information that

	indicate that a high abundance of herbivorous fish serve an important ecosystem function.
Jerry Kaluhiwa	Aloha, just for your information, like I've said, we did research on these areas (points to coastal region of the proposed NERR site). I don't only do lo'i, fishponds or marine biology. It's all what I do. We started a program up mauka with 429 acres of kalo. We doing that today too. We doing our Mālama Mauka-Makai project. What we're doing is monitoring these areas (points to mauka areas of proposed NERR site and above the NERR mauka boundary line). I was born and raised Kāne'ohe all my life. Why we suggested doing this? It's because we're doing lots of projects. We're working on the river. Kāko'o 'Ōiwi Program started in here too. We're going through a fishpond protection and used one of the key projects out in Kahalu'u. We're already doing it. We were the only one out of every island doing these projects and we will continue to do this. This is my second round and it is getting much bigger. Now we're trying to work on the whole Kāne'ohe Bay and studying limu. I've made the babies with Dr. Abbot and Jack Fisher. Thank you for letting me do this project again. Just reminding you guys we working hard. We get the Ko'olaupoko Civic Club raising money for kids who are going through college. We are not kicking back, we moving.
Luwella Leonardi	This is a tough project. It's so glamorous—rich with Christmas tree lighting. Unbelievable. Our children deserve a future here in Hawai'i and that's where I'm coming from. Is there a future for our children in Hawai'i? I personally would like this project to go away. It's taking from our future and it's not going to contribute to our children. I've seen it before, the type of focus on this bay. I grew up in the area where sea life park is located. I've seen the damages to our people and to our places. I've seen the worldwide damage projects like these have done and that's what I'm comparing it to. I have been reading the Stratton Report. I've done huge meetings in the 70s and I speak to the fisherman every day. I attended the December 4th meeting and that was tough. That meeting was missing a group of non-commercial fishermen. I attended the meetings in Kahana and He'eia in the 70s and the 80s. I attended the meeting when the Tuna industry was going down. We're supposed to focus on K-12. I'm in the schools on the leeward side. From Pearl city to Makaha. This project's curriculum is inviting. We need that, it's plausible. You know I don't see our participation. I don't see the NOAA program including our children as a part of this plan. I see more out-transits doing the bulk of this project. I don't see the relationship.

	Dawn Chang knows me really well. This is a huge comparison especially with the huge statewide meetings with the DOI. It was awful, it was nasty rotten, and I knew that it was going to be that way before it begun. It was tough and I'm still burnt out. I can't believe they're going through with this second wave of meetings. I attended all the CZM meetings in 2013. I attended the first for this project in January. And well, Dawn knows me. What I'm seeing here is that we need to take a look at the local community. Not a particular person, community or Hawaiian Civic Club. This is going to hurt us. We are a polytheistic people; we are not of a mono-god. I don't know how we're going to address the local community. I don't have the resources to keep the communication going back and forth. There needs to be more investment in money, rather than that 30% and 70% you folks talk about. I've been on that computer researching the NERS. And, I seen the Native Americans are pretty pissed about it. I'm not sitting at home I've been doing a lot of homework and asking questions. It's not going to be a good thing. We're going to have the same old problems with all the programs. I don't know the resolutions anymore.
Rocky Kaluhiwa	Aloha. My name is Rocky Kaluhiwa, and I'm the vice president of the Ko'olaupoko Hawaiian Civic Club and I just wanted guys a brief background of He'eia. Our family fought against all of the developments since the early '70s. We fought against that. The He'eia meadowlands, which was going to be another Hawaii Kai. I actually saw a model of it. The 500-berth Marina was going to either be constructed over the fishpond or they were going to fill it in. Remember when He'eia State Park at Kalaeulaula at Kealohi Point was going to be a hotel? We fought against that. Part of the plan was even to raze the broken bridge and leave a drawbridge. We fought against that. When He'eia Kea was going to be a nuclear power plant; we were the first community to take that case all the way up to the Supreme Court. I'm also on the Kahalu'u Neighborhood Board. Here, we extend our hand for help. We are working on research to look at the coral and the limu. They are not here to harm us we need the resources from them. Also, this is not just one person, community, or civic club. The restoration efforts of Native Hawaiian plants and other species is ongoing. The Ko'olau Foundation and HIMB help us research. Kāko'o 'Ōiwi does the lo'i. I just want to make a note that no taro goes into the lo'i without coming to my house first. We inspect each one. We even incubate the kalo and make sure everything is pono, that there's no snails or other diseases. Also, I don't believe in insecticides or pesticides. My grandpa ran the last poi mills in this area. You guys welcome to come, we have Mālama

	days, come. We are inclusive, we want everyone to come. My grandfather was the last konohiki for the ahupua'a of He'eia. My family before that, we were maka'ala. We're trying and I will continue to fight for the rest of my life. Come join our club, or there are other clubs. Kāko'o 'Ōiwi and the Haiku Nursery is open to the public, so come in. Even HIMB is open to the public. Come and join us, I see nothing wrong with that. Mahalo.

Appendix D. Public Engagement: Focus Group Meeting—January 31, 2015

PROPOSED HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE (NERR)
IN KĀNE‘OHE BAY, HAWAI‘I

FOCUS GROUP #1
EDUCATION/TRAINING/INTERPRETATION

Saturday, January 31, 2015 14 at 1:30 – 4:30 p.m.
He‘eia Elementary School
Kāne‘ohe 96744

AGENDA

I. Pule and Welcoming Remarks

1. **Introductions**
2. **Purpose of the Meeting**
3. **Overview of the afternoon**

II. Discussion on Strategic Planning Process

1. **Overview Presentation on He‘eia NERR**
2. **Vision for He‘eia NERR**
3. **Mission for He‘eia NERR**

III. Discussion on specific goals and objectives for Education/Training/Interpretation

IV. Discussion on the strategies and tasks to address the Education/Training/Interpretation objectives

V. Discussion of additional Education/Training/Interpretation topics that may be included in other sections of the Management Plan

VI. Next Steps

Topic	Participant	Comment
Goal	SB	At the elementary level, during "Aloha 'Āina lessons, use the "ahupua'a" system poster, by Marilyn Kahalewai as a historical sample and then utilize a picture of He'eia as the current "ahupua'a" model.
	KR	Document the land use history of the He'eia ahupua'a, for better or for worst. Utilize historical photos and testimonials. Connect the landscape history lessons with lessons about ecosystem health. This is a teaching opportunity and goes beyond literacy. We would establish a fundamental baseline by allowing students to truly feel and observe something grow and change. Children will feel personally connected to the places in which they live. In turn, they could then appreciate science at that level as a way to document the health of the ecosystem. Throughout these lessons, there would be an emphasis on the mauka to makai connection. What you do up mauka will affect makai, and vice versa. Here, we would have an opportunity to synthesize traditional and Western knowledge.
	SB	We could achieve "Environmental intelligence".
	Ulukoa	These types of lessons are currently trending, especially in the upper levels of education. There is a greater appreciation and a deeper understanding that can be fostered when to looking at indigenous knowledge and Western science side by side. Though in my experience, it is not always easy. We must be maka'ala, we must be careful, as we have both scientists and kupuna in this room. We must keep in mind when we present these bodies of knowledge to visitors and kama'āina we show the importance and all the value of each set. It is not a matter of valuing one form over the other—it is a matter of juxtaposing them. It is about contextualizing 'ike or insights in order to holistically appreciate

		He'eia.
	Mark Heckman	(1) Family is big time; I've had instances where my students have learned things from their grandparents and I teach them something contrary. I mean we all know whom'd they choose right? Their grandparents. There is something to be said about traditional knowledge and the value it holds. I don't want to lose access to the family. When we train these kids, it is an opportunity to reach their parents, families, and the essentially the community. (2)This is also an opportunity to work closely with site partners. I hope we'll have more formal connections so that when we point towards each other when teaching the students, we'll know the history of each place and the current work going on in those areas. What I'd like to see in five years is an "overnight on Moku o Lo'e" where we'd coordinate with the other site partners to bring their program participants and check out what we're doing. It's unfortunate that we're all so busy. I mean Moku o Lo'e takes everything I have.
	Dawn Chang	So I'm hearing, more site partner integration.
	Mark Heckman	Yes, whoever ends up being education lead, maybe they could formally require us to meet every so often, maybe on a quarterly basis.
	Noel Campbell	We all believe that our connection to one another is going to be only way to accomplish things however, it is difficult because we're busy and so focused on our areas. I'd like to see us launch initiatives that would allow us to come and work together. It is easy to talk about ahupua'a model, but the community aspect is difficult. We're still trying to figure that out.
	Emily Montgomery	In my experience, our management advisory committee, the site partners, meet on a quarterly basis. Many of the ideas I am hearing, well you could adapt

		many of the NERRS program frameworks to your specific goals and objectives. We have the Coastal Training Program that provides a multidisciplinary setting with reserve-based field activities and training initiatives. Second, the K-12 Estuarine Education Program that emphasizes the importance of coastal and estuarine concepts.
	Malia Rivera	How does public outreach fit in?
	Emily Montgomery	The NERRS has an outreach program component that will do that with the exception of coastal training program component.
	Matt Ramsey	He'eia is the perfect place because of its accessibility. For example, if I had a student who was in a wheel chair, even kupuna, these areas are able to house those kinds of facilities if need be.
	Rocky Kaluhiwa	I second that comment.
	Dawn Chang	I hear that "facilities" would be helpful. Would it be important for the site partners to have a "central" location?
	Rocky Kaluhiwa	Yes, He'eiakea.
	Emily Montgomery	This kind of central location would be a living and multi-purpose place that we would be able to conduct education programs, bring in administrators and legislators for meetings, maybe an interpretative hall, labs, auditorium and classrooms.
	Kanekoa Schultz	I wouldn't have labs at this central location. That's why we have HIMB. Rather than one complex, I want a diversity of structures, especially for each designated site.

	Dawn Chang	I see, so the site partners would be interested in a hybrid form infrastructure.
	Emily Montgomery	Yes, of course. Some NERRS sites don't have any structures. It all depends on what the partners desire.
	Jo-Ann Leong	I would like to look into this hybrid for of infrastructure for He'eia, what would that look like?
	Dawn Chang	Yes, this hybrid could be in the form of a small facility with visuals centered on the ahupua'a as well as the mauka to makai connect.
	Mark Heckman	Maybe we don't need a central place and designate funding accordingly to each site, especially since there are existing structures.
	Emily Montgomery	Yes, interpretive centers do not need to be built in the reserve. You could also rent another building, maybe a facility in Kāne'ohe where people are able to access it the center more readily.
	Rocky Kaluhiwa	We could be open to that, I mean our Civic Club offices are in a building near Windward mall.
	Dawn Chang	Yes, I also hear the need for more opportunities regarding the integration and coordination between site partners—furthermore, coordinating the accessibility to site partners' facilities.
	Ulukoa	Accessibility is an interesting issue. I am from Wai'anae and I have been blessed with so many opportunities to travel as military, for school, and my career. Many of those I know from my hometown were not as fortunate. So, if we are able to provide public access for those outside of this community, maybe they won't feel as ostracized.
	Noelle Campbell	Yes, access is an interesting one. Us folks at Paepae get a lot of visitors. One

		thing that is difficult is that when we reach out for people to come visit, we don't always get a good response. Money is normally the issue. We struggle because we can't always do things for free. We need to figure out how to maintain this accessibility and not give away too much to where people will take advantage.
	Emily Montgomery	One way to strategize, since He'eia is a big resource, you could set up workshops at the NERRS sight and provide justifications that the program is "regional". I've done so in the past as I lived in a county that was in proximity of a NERRS site. You can write many things with "regional", maybe Integrating science with outreach. The NERRS program is set up to do things like that.
	Kathleen Ruttenberg	My goal for outreach would be to create programs where you could involve teachers with the sites. Like a "train the trainer" type theme. Maybe fund summer fellowships for specific K-12 curriculum development. Instructors would be made aware of activities and opportunities happening in these areas, which could be promoted as field trip sites.
	Malia Rivera	With that, it's been pretty difficult for us at HIMB. We have so many constraints with the Department of Education ("DOE").
	Dawn Chang	Ok so we must address ways that we are able to institutionalize this program with the DOE.
	John Mitchell	Yes, I second the "train the trainer" idea as a possible program. NERRS is not classroom base and therefore, He'eia is the classroom. Our goal is to get the kids out into the field. We strategize a way to bring a DOE representative to the table. We need advocates in that department. We need to establish some form of trust with the DOE so we can get kids out into the field.

	Dawn Chang	I understand the difficulties that come with excursions, especially with the DOE. However, Hokule'a is doing lots of interactive learning for those of us who are not able to be on the navigating canoe or visit when they are docked. Yes, the kids should have the opportunity to physically come to the site, but maybe we could develop an "interactive learning" curriculum.
	Emily Montgomery	Yes, some of the NERRS grant money can fund interactive learning.
	Kathleen Ruttenberg	I would also like to suggest telemeter data to classrooms (wireless; transmit info). Higher-level students could do projects on the information we garner from these sites.
	Mark Heckman	Well I can tell you, from a student perspective, its not exciting. However if we incorporate images, that could help. Although it is our strongest priority to get the kids in the field. We've done this telemeter type approaches, so what can we do different with this NERRS program?
	Dawn Chang	Overall, I'm hearing that we need to find a way to integrate our children's experience amongst the mauka to makai connection.
	Ulukoa	One strategy for incorporating kupuna knowledge is to have them physically or have their testimonials recorded at the "welcoming center" as a prelude to site visits. Upon each group's return, debrief with Kupuna.
	Emily Montgomery	What I'm hearing is the development of an adaptive strategic plan—one that incorporates outreach and the coastal training program. In order to test priority agendas, you'll have to do many market analysis and needs-based assessments.
Training and Outreach	Stephanie Bennett	How do you incorporate training or outreach to compatible use folks? I would

		like to see commercial entities play a role in the NERRS as ambassadors.
	Malia Rivera	Develop a series of K-12 career based program.
	Jo-Ann Leong	I would like to see us develop "synthesizers" or "bridgers". This would mean training our next generation to be effective communicators—the ability to comfortably speak to those across the spectrum.
	Rocky Kaluhiwa	Develop Ahupua'a protocols and procedures document, could base on the Ahamoku System.
	Emily Montgomery	Yes, this could be an opportunity that is provided by the coastal training program. Speaking to the critical synthesis of modern science and cultural knowledge. How do we take our research and show it to legislators? We must continuously id stakeholders, policies, and avenues to achieve visions/missions.
Final Reflections	Ulukoa	I would suggest incorporating a lesson on He'eia's connection to the moku of Ko'olaupoko on a broader scale.
	Emily Montgomery	NERRS is a great framework to all the work that's currently being done.
	John Mitchell	He'eia is a prime example to examine anthropogenic dynamics in an estuarine system.
	Aarin Gross	This is a great vision of connections between man and earth.
	Jo-Ann Leong	I normally have a public distrust, but this meeting turned out great and quite productive.
	Malia Rivera	We need to properly "train our own" first and then we would be able to branch out to others in order for this process to be more productive.
	Jerry Kaluhiwa	Put the younger generation to work. This project is gonna be long-term but I look forward to it. Get plenty mana.

	Rocky Kaluhiwa	Protocols need to be incorporated.

FOCUS GROUP MEETING PARTICIPANTS
HE'EIA ELEMENTARY SCHOOL
ATTENDANCE SHEET

1/31/15 Education/Training/Interpretation	
Name	**Affiliation**
Noelle Campbell	Paepae O He'eia
Aarin Gross	Conservation International
Mark Heckman	HIMB
Jerry Kaluhiwa	Ko'olaupoko Hawaiian Civic Club
Rocky Kaluhiwa	Aha Moku Advisory Rep
Kristina Kekuewa	NOAA
Jo-Ann Leong	HIMB
John Mitchell	NOAA
Emily Montgomery	PCSU Planner
Matt Ramsey	NOAA
Malia Rivera	HIMB
Kathleen Ruttenberg	UHM
Kanekoa Kukea Shultz	Kako'o 'Ōiwi

Appendix E. Public Engagement: Focus Group Meeting—February 7, 2015

PROPOSED HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE (NERR)
IN KĀNE‘OHE BAY, HAWAI‘I

FOCUS GROUP #2
RESEARCH AND MONITORING

Saturday, February 7, 2015 14 at 1:30 – 4:30 p.m.
He‘eia Elementary School
Kāne‘ohe 96744

AGENDA

I. Pule and Welcoming Remarks

1. **Introductions**
2. **Purpose of the Meeting**
3. **Overview of the afternoon**

II. Discussion on Strategic Planning Process

1. **Overview Presentation on He‘eia NERR**
2. **Vision for He‘eia NERR**
3. **Mission for He‘eia NERR**

III Discussion on specific goals and objectives for Research and Monitoring

III. Discussion on the strategies and tasks to address the Research and Monitoring objectives

IV. Discussion of additional Research and Monitoring topics that may be included in other section of the Management Plan

V. Next Steps

Meeting Notes
1st Series of Focus Group Mtg. 02.07.2015
He'eia NERR Research and Monitoring
Goals and Objectives

Topic	Participant	Comment
Goals	Scott Larned	Start to generate data for comparison across long term trends (fisheries, water ecology, etc.).
	Kathleen Ruttenberg	Establish baselines in order to understand the magnitude of change in the Bay, the impact of those changes on this ecosystem and its health. I'd also like to see more resources to monitor current research.
	Scott Larned	Yes, we need to generate data required to make accurate assessments. Develop reference conditions, something like developing physical conditions in the absence of people used for restoration goals
	Michael Parke	Archeological and historical research: terrestrial reconstruction of what has happened in He'eia.
	Dawn Chang	This was considered a very healthy system at one point. What were the changes at those times when there were changes in land use? Understand this and we might be able to better understand our current status.
	Rosie Alegado	We need to establish the parameters that we are interested in.
	Dawn Chang	I'm hearing that we need to incorporate our goals for establishing baseline information into our vision and mission. Maybe understanding a dynamic system, such as an estuary, to monitor health of the system.
	Paulo Maurin	Will the goals we set be achievable? How specific do they have to be within the 5 year timeframe?
	Rob Toonen	To clarify with everyone, there are mandates for the NERRS to get funding. Since there's a lack of coordinated long term data, this would be an opportunity for us to establish a long term monitoring plan.
	Brian Glazer	I would suggest feasible goals such as point source v. non-Point source pollution goals.

	Rosie Alegado	Research to inform the site partners and their current work; establish some kind of shared database.
	Hi'ilei Kawelo	"Scientific" - I want it to be understood that this term is inclusive of traditional and Western bodies of knowledge.
	Dawn Chang	Another item I am hearing is to reestablish connections and coordination of info sharing. That we need to find ways to communicate internally and externally.
	Rosie Alegado	Establish a central database infrastructure, a repository of information.
	Kiana Frank	We need a person to manage and interact with scientists; some kind of a bridger to communicate and facilitate that information.
	Kathleen Ruttenberg	I second that comment. This person must research all the current studies and incorporate that as well.
	Paulo Maurin	5 themes I've been hearing: 1. Need to have integrated efforts 2. Long term and historical repository, looking forward and back. 3. Programmatic elements; and mandates to look at. 4. Accessibility to stakeholders in the community; online database, coordinator and advisory board 5. Support connections to existing efforts (not only research but curriculum and outreach etc.)
	Scott Larned	We need basic environmental monitoring for baseline understanding and the NERRS can do that for us. We should work with the DOH, NOAA and EPA monitoring databases, instead of reinventing the wheel
	Rosie Alegado	This might be difficult, especially if we have to rationalize and contextualize (a sense of what's important) the data in these data bases.
	Rocky Kaluhiwa	We also need to keep in mind that not all the surveys and scientific studies they've done are right. For example, all archaeological surveys are not accurate. We had to correct them.

		I say let's establish a monitoring system for current commercial businesses – we need to check their zoning and the activities going on there.
	Kathleen Ruttenberg	It's easy for research groups to be insulated so, we need a structure to facilitate interactions between different interest groups and maximize the way that data sets from land and sea can be incorporated.
	Megan Donahue	Coordinator needs to know the people. He or she will become the repository. This person would also facilitate presentations to these groups – a node in a personal network.
	Scott Larned	I don't think "multidisciplinary" approaches have to be so legislative in terms of our studies and interactions. Let's put down restoration monitoring as a goal – study effects of large scale restoration efforts – look at effect on NERRS resource. Land restoration and its effect on the marine resources and communities.
	Hi'ilei Kawelo	The goals to need to inform the direction of the 5 year plan. Generally, it seems that we are trying to understand our restoration efforts and their impacts on near shore waters / marine systems.
	Scott Larned	We need to measure impacts of lo'i restoration. Maybe that's where anecdotes and historical knowledge may come into play,
	Dawn Chang	I'm hearing that we need to coordinate efforts with the Department of Health.
	Rob Toonen	Gather baseline data for sea level change in order to measure and understand its impacts on fishpond and lo'i restoration.
	Scott Larned	Framework for floodwater and sediment movement through the watershed. This needs to be established to assess restoration activities. We need an integrated monitoring system and frameworks.
	Kathleen Ruttenberg	Observe changes in receiving waters.

		Paepae o He'eia could serve as a mesocosm -"artificial" system. That could be the scientific hook as an "enclosed system to quantify numbers that could not be imagined elsewhere".
	Rosie Alegado	Adopting indigenous based models for land management as an alternative to Western practices. That seems to have broader national significance. It would lend validation to assess those land management models.

Meeting Notes
1st Series of Focus Group Mtg. 02.07.2015
He'eia NERR Research and Monitoring
Strategies and Tasks

Topic	Participant	Comment
Management Plan	Rob	"Cultural orientation"
Facilities	Kathleen Ruttenberg	Cable Observatory – biological primers to measure specific info
	Rob	Infrastructure funding
	Megan	Reasonable but hesitant to build a new building Another outreach facility would require extensive resources
	John	"collaborative" science projects; opportunity available from NERRS; hire on another staff member for this position; handles grants (part time)
	Rob	Funds are highly competitive – if you have collaborative with other sites as well.
Definition of <u>healthy</u> ecosystem	Rosie Alegado	"Habitats that are in less than pristine condition". Base it on historical accounts: what color were the beaches, what kind of fish did they use to catch whether or not you can harvest certain kinds of limu etc.
	Paulo Maurin	I second this comment. Though it seems the term restoration runs counter to our visions and mission. Maybe something like "natural, tradition and coastal restoration needs to be inserted.
	Kathleen Ruttenberg	A place where native species will thrive. Removal of invasive species as they are outcompeting the native species.
	Scott Larned	We need to also think about how much monitoring is being done in and out of the Bay. What kinds of funding that will be allocated to those kinds of monitoring? Cultural health: expand lo'i and fishpond system to its current state of functioning. To optimize its production so it does not disturb its marine neighbors

		downstream.
	Kiana Frank	Layout systems within these boundaries in order to assess what is a "healthy" ecosystem. I see a healthy ecosystem as a system that is culturally functioning and has a sustainable fishpond.
	Hi'ilei Kawelo	So for this management plan, I'd suggest the following outline: Historical overview Cultural overview (past and current land and resource uses) Vision Mission Conceptual framework You can write a lot of these things without using a data set--more at a high level of thinking.
		The optimal system will be based on your subsistence needs.
	Dawn Chang	So I am hearing the following: <u>Short term</u>: Studies to be done on the coral reef impacts from lo'i and fishpond system. <u>Long term:</u> In order for us to have a healthy fishpond you need healthy coral reef system. Everyone is functioning at its optimum; but that's difficult to assess since the system is constantly changing—dynamic.

		We need to also keep in mind that we may not necessarily reach that optimization.
	Scott Larned	Our goal is to understand how each system works and the links between those systems. We need to develop or adopt an ecosystem model that links all of the systems and includes the feedbacks that makes the sets of changes in one system quantifiable versus in the other. We also need to map and calculate the export sediment in the NERRS. Our strategies and tasks need to reflect the "interoperable" system within the NERRS–similar to our integrated efforts/
	Kathleen Ruttenberg	This is where kūpuna knowledge needs to be incorporated. Questions such as "what do we need to observe?" and "what were they observing before?"
	Rosie Alegado	Listening to the guidance from our elders speaks to Hawaiian values within this historical framework.

FOCUS GROUP MEETING PARTICIPANTS
HE‘EIA ELEMENTARY SCHOOL
ATTENDANCE SHEET

2/7/15 **Research and Monitoring**	
Name	**Affiliation**
Rosie Alegado	UH
Michael Burke	DOH
Megan Donahue	HIMB
Dr. Kiana Frank	UHM
Dr. Brian Glazer	UHM
Doug Harper	NOAA
Darcey Iwashita	DOH
Hi‘ilei Kawelo	Paepae O He‘eia
Dr. Scott Larned	TNC
Paulo Maurin	NOAA
Michael Parke	NOAA
Kathleen Ruttenberg	UHM
Greg Takeshima	DOH
Rob Toonen	HIMB

Appendix F. Public Engagement: Focus Group Meeting—February 14, 2015

PROPOSED HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE (NERR)
IN KĀNE‘OHE BAY, HAWAI‘I

FOCUS GROUP #3
PUBLIC OUTREACH & RESOURCE MANAGEMENT

Saturday, February 14, 2015 from 1:30 – 4:30 p.m.
He‘eia Elementary School
Kāne‘ohe, Hawai‘i 96744

AGENDA

I. Pule and Welcoming Remarks

1. **Introductions**
2. **Purpose of the Meeting**
3. **Overview of the afternoon**

II. Discussion on Strategic Planning Process

1. **Overview Presentation on He‘eia NERR**
2. **Vision for He‘eia NERR**
3. **Mission for He‘eia NERR**

III Discussion on specific goals and objectives for Public Outreach & Resource Management

III. Discussion on the strategies and tasks to address the Public Outreach & Resource Management objectives

IV. Discussion of additional Public Outreach & Resource Management topics that may be included in other sections of the Management Plan

V. Next Steps

Meeting Notes
1st Series of Focus Group Mtg. 02.14.2015
He'eia NERR Public Outreach & Resource Management
Strategic Plan Vision & Mission

Topic	Participant	Comment
He'eia Strategic Plan Vision (ref. PPT slide # 12): Ho'ola Hou – New Life, The He'eia Ahupua'a shall be a healthy resilient ecosystem from mauka to makai that sustains natural, cultural and human resources		
Vision Statement	Paulo Maurin	Inquiry: As you say, there was plenty of conversation last week, I missed the first meeting. Don't know if the first meeting, not sure whether we we're aligning with the first meeting. From what I recall, we looked at the how the words are incorporated here. Is that the same wording as last time? Cultural, natural and community? Will the 3 focus groups be reconvened individually or altogether?
	Dawn Chang	Separately, according to your specific group.
	Peleke Flores	The boundaries are not final; using the word He'eia ahupua'a is not really the whole ahupua'a (as stated in the vision statement). That word is bigger than the boundaries.
	Uncle Jerry Kaluhiwa	If we want to change, can you do that? You going see something coming in the future, can we adjust that? We talked about moving the boundary. KHCC wants expansion to include He'eia Kea Pier & C&C lands mauka of He'eia Pier.
	John Kirkpatrick	Last time we talked in relation to research that research is always going to be related to the NERR boundaries; programs are going to go elsewhere; clearly if we're interested in cleaning up the He'eia watershed, we are going to have to talk very nicely to people who own the private land; talk to their kids. While there are many research organizations, the vision should be consistent with the He'eia NERR.
	Dawn Chang	It can be reflected in the plan, the different alternatives reflected by the community & land acquisitions.
	Paulo Maurin	The vision can be inspiration, we can aim a little bit higher even though we cannot

		see how we are going to be there but we can dream about it; mindful of the boundary later on.
	Keli'i Kotubetey	Time frame of the management plan is 5 years what happens after?
	Dawn Chang	There will be an advisory board; 5 years evaluate. Not unnecessarily vision should be 5 years, the vision can be beyond 5 years.
	Peleke Flores	Trying to see the picture; the vision we trying to bring back the system but just starting more the coastal then going up or plenty folks going all at the same time? How is it going to happen?
	Uncle Jerry Kaluhiwa	We working on another one. Every time I go to meetings like this, this is always brought up in these meetings. That we are so unique in Kāne'ohe, we have one of the best place in the whole Hawaiian chain; excellent research already done; need the documents of the research already done – to research steps from mauka to Makai; provides a unique opportunity to provide as a model for other restorations; fishpond – Lāna'i is one of them, Maui is another one; Big Island is another one; I been to everyone; ours is unique; using He'eia as a model
	Dawn Chang	Uniqueness of He'eia estuary; greater understanding and a desire for better internal coordination. How do individuals affect this estuary - from a vision standpoint? He'eia should be a model for other estuaries.
	Peleke Flores	Whatever where the He'eia part, where the water stay; resilient ecosystem when it comes to restoring that stuff, it was basically built for the food; and everything else will come along with that – culture, natural resources; is this just about looking nice or looking good on paper or are we trying to feed the people; the river; basically made for in the beginning; I from Kaua'i, bring back the taro patches to feed everybody. Today, the birds come back, everything comes back; but gotta start up mauka first. But if we start from the bottom up for our system, we trying to bring back what it was meant for in the beginning.
	Dawn Chang	So we are looking for it to be functional.
	Peleke Flores	Gotta start from mauka; if everyone doing stuff at the same time, the opala still

		coming down from mauka.
	Aunty Rocky Kaluhiwa	Should we include cultural practitioners? Don't forget we have other partners aside from the 3 mentioned (Paepae o He'eia, Kāko'o 'Ōiwi, HIMB); there is the Ko'olau Foundation, Ko'olaupoko Hawaiian Civic Club, Aha Moku
	Paulo Maurin	Integrating; we are trying to talk about natural, cultural and human; last week we were talking about community; natural resources, cultural practices and human community; should the word "practices" be added too?
	John Kirkpatrick	Its values too.
	Keli'i Kotubetey	Can work but cause some confusion; fixing something just to be a natural resource it could be competing depending on who's thinking about it
Strategic Plan Mission: Mālama to care for. To practice and promote responsible stewardship consistent with principles and values of the traditional ahupua'a utilizing innovative research, education and training		
Mission Statement	Kalei Kini	I am more comfortable with ahupua'a in the vision statement because it's more defined here: although in the previous statement too large a concept; whereas it's addressed here; it might be more appropriate.
	Keli'i Kotubetey	The whole point of ahupua'a is human interaction with the land; I like it in the vision statement because then it incorporates; possibility of increasing the boundaries; if it's in the vision then maybe going forward, then, maybe it needs to be in the vision statement.
	John Kirkpatrick	Defined what stewardship means to him – someone who is dusting off something. Stewardship is almost removed; it can sound only one way "taking care of the land."
	Aunty Rocky Kaluhiwa	Mālama encompasses a broader meaning beyond stewardship; put the 2 words together; that is why they put up the ahupua'a markers; to educate, going have to learn our way too.

	Dawn Chang	Would you be more comfortable with kuleana?
	Peleke Flores	To mālama is being a good steward; use kuleana.
	Aunty Rocky Kaluhiwa	In ancient times, we may not have used the word sustainability; but we automatically planned for the next 7 generations.

Meeting Notes
1st Series of Focus Group Mtg. 02.14.2015
He'eia NERR Public Outreach & Resource Management
Goals and Objectives

Topic	Participant	Comment
Goals	Kalei Kini	What is "place based?"
	Paul Conry	Site specific.
	Shahin Ansari	Typo – the goal for NERRS (national) should be "strategic plan – ~~science~~ **protected places**" goal.
	Keli'i Kotubetey	To me, I think this includes but it goes well beyond the 3 that you have been mentioning; Paulo mentioned earlier; the three organizations are only as strong as the individuals who do the work. It's the public, its volunteers who are participating at those sites, students, the researchers driven by the organization. Then there's the residents; the people who use the resources in the area; this goal is the one that should be the most inclusive of the three and more and beyond; meaning they may not be here in 20 years; this goal should be much broader.
	Rob Toonen	How about tying in the public? Better education about the natural and cultural resources of this place & engaged in the sustainability.
	John Mitchell	The philosophy is western, that doesn't fit; resilience of the community as a whole; feed themselves.
	Paulo Maurin	Question: I think it's fairly difficult to come up with a goal to outreach and resource management. It's easier to link with education. Have a hard time coming up with a suggestion; that people who know the ahupua'a what the place is like understanding of the place, having the public that live in the area become aware of those connections and the ahupua'a concept.
	Dawn Chang	Take it apart & focus on goal for public outreach.
	Paulo Maurin	People should know the boundaries; understand the place & the connection; people in the area should be aware of the connection.
	Rob Toonen	Coordination; site manager; and outreach educator
	Dawn Chang	Our team's job is to find out what are your goals? Let us try to figure out how to make it fit into the plan.
	John Mitchell	Know what is going on with all the moving parts and we also want the rest of the world to know. This is what we expect you to know about this area. International coordination amongst the site partners as well as external coordination.

		With the common goal; everybody working together for the common goal.
	Kalei Kini	Hawaiian Civic Clubs do education & outreach.
	Aunty Rocky Kaluhiwa	We go out and attend hearings. Trying to get matching funds. We testify. Some of the non-profit groups, we cannot do that. The ahupua'a markers took 5 years; federal city and state funds took 5 years; it was a task; federal didn't want to use the 'okina. Then we had to come up with a design. To the Ko'olaupoko Hawaiian Civic Club, it was worth doing. We went with the1876 map, before the missionaries came and changed the wording. It was our kuleana to do it.
	Peleke Flores	'Ili markers for us at the pond. We get plenty outreach, not talk about how we are affected. Get the app on the phone. It's like a public outreach to learn about the fishpond. Everybody does (their) parts like that in the ahupua'a. You can watch the t.v. in the food court.
	Aunty Rocky Kaluhiwa	They had a trivia contest. They took it ran it with HECO and that went one for a couple months. Then we had something in midweek. It was good that we are all able to work together. Next year, we are going to be hitting the leg to get matching funds.
	Kalei Kini	Even the schools, they use Kāne'ohe bay with the students. Do we kind of know, what current public outreach opportunities right now? Current educational opportunities?
	Paulo Maurin	No central depository? There is people that know a good amount.
	Kalei Kini	I'm sure that schools are doing their own thing. Whether in videos of Kāne'ohe bay, I'm sure they are doing that already.
	Aunty Rocky Kaluhiwa	They do. But all the research projects, they do tremendous work with the schools. Right now have docents on tours; students from Castle High School; everybody does something. You're right, maybe under the NERRS project we can integrate all these projects together.
	John Kirkpatrick	My wife works on the other side of the island. Often when a teacher burns out or moves, the program ends; need to keep a listing of what's been done, which would be helpful over the long haul.
	Peleke Flores	Same problem we had just with our returning people. We are telling them the same basic

		information. Second level, we'll go higher and higher with repeat people; redevelop the info instead of repeating the same info. Set a picture of the ahupua'a as long as they all touch back to the water.
	John Mitchell	The groups all know what's going on – it's the teachers that don't always know. Need to get an inventory; what's going on with the DOE
	John Kirkpatrick	Anytime you go in the water and you see resource management, it means who gets the most use. Who figures out how to manage, who gets how much fish one gets. Pretty clear how Paepae works, how Kako'o works. There's other people using it too – recreational. Resource management is trying to figure out what you are going to do to manage the ocean. Should the NERR's council be giving input to agencies on how to enforce the area even if we do have regulatory things in place?
	Peleke Flores	Good he brought that up. That's what we gotta figure out now because we are so separated. How do we enforce that?
	John Kirkpatrick	What happens if somebody has a commitment in the bay? They don't like how you're doing something in the Bay – it's affecting my kuleana/business/issues. Does NERRS MP have any input? Do we have anything to say about somebody being unhappy?
	Kalei Kini	I live in Kailua – come from Waimānalo, Kailua. Used to fish in the 1960s and 1970s in Kāne'ohe bay, as a Kailua person, I would defer to someone from Kāne'ohe Bay.
	Aunty Rocky Kaluhiwa	Had this discussion a few weeks ago. They incorporated for the first time in the history, that they had someone sitting at the table at forestry and wildlife. All on the same page to protect our resources; take care of your kuleana. There was a hearing where they wanted to close net fishing in Kāne'ohe bay. The biggest contention was from Kailua. We want our bay open because some of the people use it for food; Hawaiian traditional way is to incorporate native Hawaiian values – it'll work. We have to step forward to make sure they take care of their kuleana. Irresponsible fishermen are why we're in the situation we're in today.

	Peleke Flores	Not going make everybody happy. But if we stay strong; tell 'um, no can do your stuff there.
	John Kirkpatrick	Concept of the kuleana gives you a strength to cut thru the b-------. Whether the NERR should participate in the management means making things work for everybody. I'm just assuming that use conflict will come up. Wondering how the NERR is involved in addressing those? If you have somebody who is doing something in the land area or in the sea area that isn't pono, then the advisory board should be able to at least express that concern to say DOBAR.
	Rebecka Arbin	So the NERR advisory board of the state agency, they will need to understand what is permitted and what isn't permitted and if there are changes that need to be made by the State, then it's up to them how to change it or recommend to DLNR. The advisory board has an opportunity to make an opinion. The state laws don't change as a NERR is designated. Maybe there is tool that all the NERR's partner can work with.
	John Kirkpatrick	Get it expressed in one voice; this is what the NERR advisory board can help with.
	Aunty Rocky Kaluhiwa	If I see something wrong, I'm going to speak up; it's our kuleana to mālama.
	Keli'i Kotubetey	The most contentious part was the fishing. Are you going make new regulations? The ocean is where the biggest contention was. Make sure that it stays away from specific words so it doesn't make people pissed off with the NERR. Be sensitive that no new regulations will come out of this. Boils down to kuleana and the NERR will support proper management to those resources. Can come up with a resource management goal but it's sticky.
	Rebecka Arbin	In terms of a goal of the resource, it's not the active manager but it could be a forum where you can learn about the other managing strategies; express their opinions to DLNR; so it's not like the NERR is a new entity; it's more like a platform.
	Peleke Flores	Using the NERR to help enforce what we are trying to plan.
	Uncle Jerry Kaluhiwa	When we first started this, the fisherman weren't sure what was going to happen. When the tour boats started, they have these walking under the sea. So they using their fishermen's place; when you cut their line out, they going make noise. Shorten on the outside and now they coming on the inside. We always respect the place. We feel it's good that they have all the research. They start moving their boats along the bay. They kind of damage the area. Over 1,000 a week walking the reef and it does affect the area. The

		fishermen getting tied up. We need to restore more in Kāne'ohe. Get outlaws that hunt when the season is closed, have a time limit before DLNR come to work; by then, the fishermen are gone.
	Aunty Rocky Kaluhiwa	We should mālama what's happening down in the Bay. Don't even go into making new rules and let the 'Aha Moku deal with that; the kapu system. Move forward with our own projects. NERR's should focus on their kuleana which his not making new rules. Need to engage with fishermen to get them on the same side.
	Kalei Kini	Will facilities that expand other users increase the # of users of Kāne'ohe Bay? Research and therefore conflicts and so on.
	Paul Conry	The reality is NERR is not going to set-up regulations. Provided explanation of the NERRS & how it will connect all 3 resources.
	Dawn Chang	It is having both the long-term fisherman; what it was like and what it is now; having the scientific information; it helps to manage that.
	Keli'i Kotubetey	From the land side, what is the research monitoring and education? From the upper reaches, the land side, but if some research comes up from HIMB, that relates to fisherman don't know if it's coming from the fishpond, poi or whatever, the NERR is the outreach to get that information out. The public areas of the NERR, the ocean spaces, but then the private property of the NERR. But if some other information tells us we should be doing something different because it's having negative impacts, or doing something because it's having positive impacts we can have it changed? Seems like resource management is tied to research and the monitoring that's coming out of it; the western side is fundable by the NERR but what makes us unique is we use the kūpuna stories.
	John Kirkpatrick	It's information and discourse of taking care of what we have here to sustain it for the future.
	Aunty Rocky Kaluhiwa	HIMB for years had a bad reputation with the community – for us to use their information.
	Dawn Chang	The traditional ahupua'a is the common thread at all these meetings.
	Kalei Kini	In Kailua, Kawai Nui Marsh, then the tour buses are doing to come. Any facility, any kind of

		improvement and trails, then busloads of tourists are going to come. Busloads of Japanese tourists that might be holding us back doing something good for Kawai Nui Marsh trying to incorporate something like that.
	Dawn Chang	When you do go, go with a level of sensitivity.
	Keli'i Kotubetey	Other NERRs are they unpopulated? Populated? Heavily populated? Thinking about the uniqueness of He'eia. Just curious, how well used are other NERRs?
	Kalei Kini	Other previous NERR was at Waimanu nothing was happening there.
	Rob Toonen	The NERR across the country reaching from San Diego Marine Corps helicopter base – not really populated at all; they are all over the place, very few places likes Michigan and Alaska that are influencing both. Very few that have traditional cultural practitioners; He'eia is the only site where the community is involved from the start & the only one with a fish pond. This is the only site that I know of that has historic site.
	Peleke Flores	What is the bays used for? Food?
	Rob Toonen	Shipping lines; chunks cut off where ships can pass back and thru them. No other NERR where the intent is to feed people. The filter grounds were the river meets the sea.

FOCUS GROUP MEETING PARTICIPANTS
HE'EIA ELEMENTARY SCHOOL
ATTENDANCE SHEET

2/14/15 **Public Outreach & Resource Management**	
Name	**Affiliation**
Peleke Flores	Paepae O He'eia
Jerry Kaluhiwa	Ko'olaupoko Hawaiian Civic Club
Rocky Kaluhiwa	Aha Moku Advisory Rep
Kalei Kini	Community
Keli'i Kotubetey	Paepae O He'eia
Paulo Maurin	NOAA
John Mitchell	NOAA
Bill Thomas	NOAA
Rob Toonen	HIMB

Appendix G. Public Engagement: Focus Group Meetings—March 10, 11, and 12 2015

PROPOSED HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE (NERR)
IN KĀNE‘OHE BAY, HAWAI‘I

2nd SERIES OF FOCUS GROUP MEETINGS

King Intermediate School, Kāne‘ohe from 5:30 – 7:30 p.m.

Tuesday, March 10 – Education and Training
Wednesday, March 11 – Research and Monitoring
Thursday, March 12 – Public Outreach and Resource Management

AGENDA

I. Pule and Welcoming Remarks

II. Discussion on Draft Strategic Plan

III. Discussion on strategies to address specific goals and objectives for:

- **A. Education and Training (March 10)**
- **B. Research and Monitoring (March 11)**
- **C. Public Outreach and Resource Management (March 12)**

IV. Discussion on Components of the Management Plan

V. Next Steps

minutes

Education and Training		
3.10.2015	5:30pm – 7:30pm	King Intermediate School
Meeting		
Type of	Focus Group	
Facilitator	Dawn Chang	
Note taker	Lu'ukia Nakanelua	
Attendees	Dawn Chang, Paul Conry, Shirlyn Ho'okano, Lu'ukia Nakanelua, Dietrix Duhaylonsod, Joshua Hekekia, Bill Thomas, Jean Tanimoto, Bill Sager, Aarin Gross, Kauanoe Campbell, Josephine Patacsil, Mahealani Cypher, Rocky and Jerry Kaluhiwa and Tiffany Patrick	

Miscellaneous: NERRS Boundary

Mahealani Cypher expressed that in order for the ahupua'a model to function at full capacity, the Reserve boundary should encompass the entire ahupua'a of He'eia.

Dawn Chang acknowledged the importance of "walking" the ahupua'a "talk" in regards to the Reserve boundary however, for the purposes of this five-year management plan, the proposed boundary was designated as a feasible area for the NERRS. If all goes well in accordance with the parameters set by this five-year plan, the site partners could potentially plan for the Reserve boundary expansion as apart of their long-term goals.

Mahealani Cypher understood and suggested that their long-term goals for the boundary expansion be incorporated into this five-year management plan. Language such as "the boundary expansion will occur in incremental phases" and that this NERRS will "reorient community thinking" that would then prompt groups such as private property owners, to be a part of the ahupua'a model being executed by the NERRS.

Discussion: Draft Strategic Plan

Vision – Revisions

"Ho'ōla – To restore ecosystem balance as *framed by Native Hawaiians practices that are reflected in the ahupua'a land management system*. The He'eia ahupua'a shall be a global example of a thriving and resilient ecosystem from mauka to makai *that feeds* and sustains our natural, cultural, and human communities."

Mission

"…traditional ahupua'a land management system supported by innovative research, traditional knowledge, education, and training that supports *lifelong learning* and a healthy and vibrant ecosystem that in turn nourishes the community."

minutes

Discussion: Strategies for Goals and Objectives

Goal
No further revisions.

Objectives
Kauanoe Campbell noted her concerns about keeping the current coordination and collaborative efforts between existing site partners.

Discussion: Strategies

Educational Initiatives

- Develop a booklet or a brochure to be incorporated in schools—especially on the Windward side.

Public Access Issues

- Focus Group expressed that they have no interest in creating public trails at this time.

Central Facility

- Kauanoe Campbell expressed that Paepae o He'eia would be interested in a central location to house their, research materials, publications, maps etc.
- Focus Group agreed that public accessibility is important.
- Paul Conry: Do site partners wish to maintain their individual sites?
- Site partners would like to maintain their individual sites and have a central meeting location.
- Bill Sager: Evaluate consequences and implications of the "tsunami flood zones" throughout the ahupua'a of He'eia. If site partners want the central facility to serve as a repository for physical records, these records should also be digitized.

NERRS Staff – Discussion of their roles and responsibilities.

- Site Manager
- Research Coordinator
- Education Coordinator: Dietrix emphasized the importance of this position. Coordinator would be an integral part of the coordination efforts between site partners, the community, government officials and commercial sector. Site partners were also encouraged to think about qualities and criteria for an ideal candidate.

minutes

Research and Monitoring		
3.11.2015	5:30pm – 7:30pm	King Intermediate School
Meeting		
Type of	Focus Group	
Facilitator	Dawn Chang	
Note taker	Lu‘ukia Nakanelua	
Attendees	Paul Conry, Shanin Ansari, Jean Tanimoto, Dawn Chang, Joshua Hekekia, Kanani Kealalio, Lu‘ukia Nakanelua, Ricardo Zanre, Hi‘ilei Kawelo, Doug Harper, Paulo Maurin, Bill Sager, Jo-Ann Leong, Jospehine Patacsil, Donna Camvel, Mahealani Cypher, Rocky and Jerry Kaluhiwa	

Discussion: Draft Strategic Plan

Vision
Ho‘ōla – To restore ecosystem balance as envisioned by ahupua‘a. The He‘eia ahupua‘a shall be a global example of a thriving and resilient ecosystem from mauka to makai that feeds and sustains our natural, cultural, and human communities.

No further revisions.

Mission

Kuleana – Privilege and responsibility. To practice and promote responsible stewardship and outreach consistent with the principles and values of the traditional ahupua‘a land management system supported by innovative research, traditional knowledge, education and training that supports a *resilient* ecosystem that in turn nourishes the community.

Donna Camvel – We should make mention of “climate change” somewhere in this statement since it works hand in hand with resilience. Should those impacts become critical, we will have a place for that.

Ricardo Zanre – Replace “healthy and vibrant” for “resilient”.

Discussion: Goals and Objectives

Goals

- Donna Camvel would like to remove the term “watershed” and replace with “ahupua‘a” throughout the entire document. “Ahupua‘a” is a complex holistic system that acknowledges the relationships between inanimate and animate beings. “Watershed” does not capture that fundamental component.

- Jo-Ann suggests footnoting the term “ahupua‘a”, while Dawn clarifies that we will make mention of this in the document’s “cultural orientation” section.

- Ricardo points out that the goal seems focus more on ecological

components instead of the relationships and benefits shared between man and the environment.

- Paulo Maurin states that the statement "reads a little narrow". He suggests replacing "research" and "sustainable food consumption. We need to link "research" back to the "guidance of environmental health".

- Donnie Camvel states that we need to begin to look at ways in which this plan will benefit Kanaka Maoli and the people who work in the field by enriching the "cultural landscape". She echoes Paulo's point that the cultural component is lacking in the goal statement. Although this document isn't legally binding, she reminds us that the document should speak to our community's voice and worldview. She is also grateful for this opportunity to explore each other's intentions for this project.

Objectives

- Hi'ilei Kawelo revised to insert the term "directed research". As research will be directed by an informed professionals.

- Dawn Chang suggests "integrated research".

- Mahealani Cypher delves further and presents the term "collaborative research".

- Paul Conry adds the term "applied research".

- Doug Harper states that (3) needs to be reworded.

- Ricardo Zanre asks: how will we execute the collaborative research?

- Jean Tanimoto reminds everyone that the nomination requires an "applied science" component. In turn, research would help to inform the State and other managers in the ahupua'a regarding best management practices.

- Donna Camvel states that the term "traditional ecological knowledge" has an antagonizing connation. She suggests "traditional, customary and contemporary practices", which would encompass a broader audience.

- Dawn Chang suggests that we incorporate the prior mentioned term as a part of the legal status. It is the Government's affirmative obligation to protect those rights.

- Jo-Ann Leong suggests the term "traditional and local knowledge".

Discussion: Strategies

- Hi'ilei Kawelo seeks a change in (2). Replace "impacts" with "effects".

Potential Locations for Central Facility:

- Omega station
- He‘eia State Park
- Focus group emphasized the importance of accessibility.

(5) How will we inform/relay information to community about research?

- Presentations at the central facility.
- Include scientists.
- Comprehensive baseline of information.
- Research coordinator will coordinate with scientists and serve as a “conduit for dissemination.
- Gap analysis within the research is required.
- Scientists advise site partners to inform management practices [options, consequences, etc.].

Dawn Chang reminds the focus group that there are other components of the management plan that address the points above.

- (8) Paulo Maurin states that this point seems prescriptive--especially if its not mandated
- Dawn Chang stated that (8) was meant to read that way in order to reinforce that it is a “responsibility” rather than “voluntary”.

- Jean Tanimoto suggested having HIMB extend their database to the NERRS. Much of the information that has been and will be gathered is exceptional leverage with other NERRS.

- It was suggested that we incorporate a strategy about interactions between our site and other NERRS sites (what are the benefits? A lot of what we have occurring at our site could be instructive and informative).

- Add another component regarding the production of “bridgers”.

- Hi‘ilei Kawelo – What about research occurring outside of boundary? (i.e. fish) make mention of a research “buffer”. We shouldn’t feel limited by those lines. Part of the data gathering is going to entail research outside of the boundaries. Incorporate something about connectivity. She suggests the following statement be incorporated into the strategies: “create opportunities to conduct research that may at times exceeds the boundaries”.

- Donna Camvel would like to see the development of “contemporary mo‘olelo”. They would reflect and track changes in the ahupua‘a over time. This would obviously require expertise in the language and would confirm the “tenacity of the system to respond” in a poetic and digestible way.

As a side note, it was suggested that we utilize the management plan website for public comments regarding DRAFT management plan.

minutes

Public Outreach and Resource Management		
3.12.2015	5:30pm – 7:30pm	King Intermediate School
Meeting		
Type of	Focus Group	
Facilitator	Dawn Chang	
Note taker	Lu‘ukia Nakanelua	
Attendees	Shirlyn Ho‘okano, Dawn Chang, Jean Tanimoto, Joshua Hekekia, Lu‘ukia Nakanelua, Paul Conry, Shahin Ansari, Bill Sager, Judy Lemus, Kalei Kini, Mahealani Cypher, Peleke Flores, Bill Tam, Rocky and Jerry Kaluhiwa, Paulo Maurin, Doug Harper	

Discussion: Draft Strategic Plan

Vision

- Judy Lemus likes the broader definition of “feeding” and “sustain”. It reads more holistic.

Mission

- No further revisions.

Discussion: Strategies for Goals and Objectives

Goals

- Judy Lemus suggested replacing “community” with “*various communities*”.

Objectives

1. Broaden the phrase “among residents and visitors”. Make mention of other interest groups such as commercial and military entities since they also have an impact.

2. “local, *national,* and international…”

Discussion: Components of the Management Plan

Strategies

1. “sustainably managed” – perhaps the plan meant that management would be “adaptive” to sustain the resources.

   “Restore and *adaptively* manage *to sustain* the…”

2. Broaden term “marine ecosystem”. In order to maintain connectivity replace with “sustainable” ecosystem.

3. "Central group" may generate sensitivities; organization will be the "coordinating" organization; "aggregating information" or "establishing networks".

4. Statement seems prescriptive. "Rules and regulations" seems redundant. Last phrase is much more relevant. –source of info for internal and external use.

5. "Informed opinion"

    - Dawn Chang cautioned the group regarding the term "informed" as it would expose the Board to liability.
    - Rather than informed opinion, a more appropriate characterization would be "will *provide inquiry…"*
    - Paul Conry asked the group if they foresee the NERRS playing an advocacy role? The group expressed their concerns about attracting "advocates" or "lobbyists" to the project.
    - Combine strategies (4) and (5).

6. Remove the term "versus".
7. Reword this statement so that resource management also guides "education and research" activities.
8. Insert "Utilizing expertise of cultural experts…"
9. Maintain ongoing communications so that even though they are not in NERRS boundary, they should have the same access.
    - Expanding outreach to incorporate other partners
    - Working towards the long-term goal of expanding the boundary to encompass all of mauka etc.

Conclusions	

Group is extremely adamant about expanding the NERRS boundaries to include Ioleka'a and Haiku stream and "checkered reef". Their concerns with project managers and Office of Planning grow regarding this matter.

Expand goals, objectives, and strategies; how do we achieve the long-term vision of expanding the first proposed NERRS boundary?

FOCUS GROUP MEETING PARTICIPANTS
KING SAMUEL WILDER INTERMEDIATE SCHOOL

3/10/15 **Education/Training/Interpretation**	
Name	**Affiliation**
Noelle Campbell	Paepae O He'eia
Mahealani Cypher	Ko'olau Foundation
Aarin Gross	Conservation International
Jerry Kaluhiwa	Ko'olaupoko Hawaiian Civic Club
Rocky Kaluhiwa	Aha Moku Advisory Rep
Josephine Patacsil	Mauka Landowner
Tiffany Patrick	USMC
Bill Sager	Kāne'ohe Neighborhood Board
Jean Tanimoto	NOAA
Bill Thomas	NOAA
3/11/15 **Research and Monitoring**	
Name	**Affiliation**
Donna Camvel	UH
Mahealani Cypher	Ko'olau Foundation
Doug Harper	NOAA
Hi'ilei Kawelo	Paepae O He'eia
Jerry Kaluhiwa	Ko'olaupoko Hawaiian Civic Club
Rocky Kaluhiwa	Aha Moku Advisory Rep
Jo-Ann Leong	HIMB
Paulo Maurin	NOAA
Josephine Patacsil	Mauka Landowner
Ricardo Zanre	Conservation International
3/12/15 **Public Outreach & Resource Management**	
Name	**Affiliation**
Mahealani Cypher	Ko'olau Foundation
Peleke Flores	Paepae O He'eia
Doug Harper	NOAA
Jerry Kaluhiwa	Ko'olaupoko Hawaiian Civic Club
Rocky Kaluhiwa	Aha Moku Advisory Rep
Kalei Kini	Community
Judy Lemus	UH
Paulo Maurin	NOAA
Bill Sager	Kāne'ohe Neighborhood Board

Appendix H. Public Engagement: Steering Committee Meeting — March 31, 2015

PROPOSED HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE (NERR) IN KĀNE‘OHE BAY, HAWAI‘I

STEERING COMMITTEE MEETING

Tuesday, March 31, 2015 at 2:00 – 4:30 p.m.
Ko‘olaupoko Hawaiian Civic Club Office
46-005 Kawa Street, #104
Kāne‘ohe, Hawai‘i 96744

AGENDA

I. Pule and Welcoming Remarks

II. Discussion on Draft Strategic Plan

III. Discussion on proposed content for:

1. **Management Plan Table of Contents**
2. **Management Plan**

IV. Next Steps

V. Closing Pule

Appendix I. Frequently Asked Questions

Q: *What is an Estuary?*

A: Estuaries are coastal areas where salt water from the sea mixes with fresh water from rivers and streams. They are among the most productive ecosystems on Earth. Some familiar examples of estuary ecosystems include Kaneohe Bay, Oahu; Kealia Ponds, Maui; Waipio Bay, Hawai'i and Wainiha Bay, Kauai. Whether they're called a bay, harbor, inlet, or lagoon, estuaries are the transition area between the inland waters and the sea. The physical make-up of estuaries can vary widely, as illustrated by the photos below.

Examples of Estuarine Physical Characteristics

Exposed Coast

Sheltered Coast

Bay

Embayment

Tidal River

Lagoon

Perched Wetlands

Anchialine Ponds

In addition to physical composition, estuaries include different ecosystem types as shorelands transition to submerged lands. Photos of ecosystem types follow.

Examples of a variety of ecosystems that can be associated with estuaries:

Shorelands

Coastal Shrublands

Coastal Grasslands

Maritime Forest-Woodland

Transition Areas

Coastal Marshes

Intertidal Beaches

Intertidal Sandflats

Intertidal Rocky Areas

Intertidal Algal Beds

Submerged Bottoms

Subtidal Hard Bottoms

Subtidal Soft Bottoms

Subtidal Plants and Coral

Q. *What is NERRS?*

A. NERRS is an acronym for National Estuarine Research Reserve System. The National Estuarine Research Reserve System is a network of 28 estuaries, representing different biogeographic regions of the United States, that are protected for long-term research, water-quality monitoring, education and coastal stewardship. Established by the Coastal Zone Management Act (CZMA) of 1972, as amended, the NERRS network is a partnership program between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. NOAA provides funding, guidance and technical assistance to support research. Each reserve is managed on a daily basis by a lead state agency or university, with input from local partners. Hawaii does not have a NERRS reserve and the Pacific biogeographic region is unrepresented in the NERRS network. More information about the NERRS can be found at http://www.nerrs.noaa.gov/.

Reserve System Sites:

Q. *What is the legal authority that enables and regulates the NERR program?*

A. Several laws and executive orders form the statutory basis of the Reserve System, including the Coastal Zone Management Act (CZMA) of 1972, as amended. A link to the CZMA is here http://coastalmanagement.noaa.gov/about/media/CZMA_10_11_06.pdf. The regulations pertaining specifically to the Reserve System, including the nomination process, NERR characteristics and planning requirements are housed in the Code of Federal Regulations (CFR). A link to the applicable chapter and subpart of the CFR is here http://www.nerrs.noaa.gov/BGDefault.aspx?ID=64.

Q. *If a NERR site is designated in Hawaii, will there be restrictions to the cultural, recreational or commercial activities that occur in the area?*

A. As part of the NERR designation process, the Code of Federal Regulations (15 CFR 921) that set the requirements for NERR sites requires development of a management plan. The management plan must consist of several elements, including a public access plan as well as a resource protection plan. These two plan elements guide allowable uses, describe uses that will require a permit and articulate how the public will interact with the site and its resources. The Code of Federal Regulations does not set forth specific restrictions on uses or activities in NERRS sites. States are allowed to develop their management plan in a manner that respects human as well as natural resource needs. For example, the San Francisco Bay NERRS Public Access Plan acknowledges "traditional uses" as follows: "*Recreational and commercial fishing, hiking, horseback riding, bicycling, camping, and boating are all traditional uses within the boundaries of the Reserve sites. Some of these activities are subject to state regulation and require licenses and/or permits. Traditional use access will continue according to local and state laws."* This is just one approach that a NERR Management Plan can take. Development of a management plan for a Hawaii NERRS site will require the State to work with stakeholders to determine an approach that serves Hawaii's resources and people best.

Q. *Does the NERRS designation mean that new Federal regulations are imposed?*

A. The NERRS designation does not add any new Federal regulations.

Q. *Why should Hawaii participate in the National Estuarine Research Reserve System?*

A. Currently, the NERRS does not include a representative Pacific island estuary. Designation of a NERRS site in Hawaii will facilitate research about our unique estuaries and support decision-making about our coastal resources. A site in Hawaii would also create new opportunities for educating residents and visitors about Hawaii's unique native plants, animals and environments that connect the land and the ocean. These "living laboratories" focus on important resources that are easily overlooked but are rich with life and critical to the health of a watershed.

Q. *What is the process for designating a NERRS site in Hawaii?*

A. The Office of Planning's Coastal Zone Management Program is conducting a selection and evaluation process to select a site. Proposals for a Hawaii NERRS site will be accepted by the Coastal Zone Management Program until 4:00 PM, May 15, 2013. Proposal forms, checklists and resources pages are all available on the CZM Program's website http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process/. Site selection criteria have been developed and are also available for review on the website. An objective Site Evaluation Committee will review the proposed sites against the selection criteria and develop a "short list" of potential NERRS sites that meet the selection criteria and recommend a preferred site and alternative sites. These recommendations will be reviewed by a neutral Site Selection Committee. This committee will recommend a site to the Governor for nomination to NOAA. The Governor will then submit to the NOAA Administrator a site selection document and a nomination letter identifying the proposed site by December 31, 2013. NOAA will review the site selection document and send a letter to the Governor accepting or rejecting the nomination. Once approved by NOAA, an Environmental Impact Statement and Management Plan must be developed. Upon approval of the EIS and Management Plan, the site is officially designated and added to the NERRS network.


Site Selection and Nomination
Draft Environmental Impact Statement/Draft Management Plan
Final Environmental Impact Statement/Final Management Plan
Designation Findings and Certificate; Record of Decision
Designation Ceremony

HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE

FREQUENTLY ASKED QUESTIONS

Below is a list of frequently asked questions (FAQs) and responses regarding the proposed designation of He‘eia estuary in Kāne‘ohe, Hawai‘i as a National Estuarine Research Reserve (NERR). These FAQs are compiled from questions raised by the public at scoping and informational meetings during the site designation process.

Q. *If a NERR site is designated in Hawai‘i, will there be restrictions to the cultural, recreational or commercial activities that occur in the area?*
A. No, the NERR designation does not add new regulations or restrictions on uses or activities within the NERR boundaries. The existing Federal, State, and County rules and regulations that apply to the area will continue to apply. As part of the NERR designation process, each NERR site is required to develop a management plan including a public access plan as well as a resource protection plan. The management plan will contain a summary of existing rules and regulations on uses and activities in the area that identify permissible and prohibited uses and activities. For example, the San Francisco Bay NERRS Public Access Plan acknowledges “traditional uses” as follows: “*Recreational and commercial fishing, hiking, horseback riding, bicycling, camping, and boating are all traditional uses within the boundaries of the Reserve sites. Some of these activities are subject to state regulation and require licenses and/or permits. Traditional use access will continue according to local and state laws.”* A similar approach may be used for the He‘eia NERR Management Plan.

Q. *Does the NERR designation mean that new Federal regulations are imposed?*
A. No, the NERR designation does not add any new Federal regulations.

Q. *How were the boundaries determined for the NERR proposal?*
A. The general location and boundaries for the He‘eia NERR site were first proposed by the He‘eia community partners and submitted to the Office of Planning for consideration as a new NERR during the site selection process in 2013. Input on the appropriateness of the site and proposal boundaries was solicited from the general public, the neighboring community, affected landowners, and local, state and federal agencies during public meetings in January and February, 2014. Based on feedback, the Office of Planning revised the boundaries taking into consideration landownership boundaries, site partner’s conservation plans, and what would meet the national guidelines for selection as a new NERR site. Those boundaries were the ones included in the nomination document and submitted to NOAA by former Governor Abercrombie for consideration as a new site (Figure 1).

Figure 1. Proposed He‘eia NERR site boundaries as included in the Hawai‘i NERR Site Nomination Document, May 2014.

Q. *Can the boundaries for the NERR be changed, and how?*
A. Yes, changes to the boundaries can be made during the NOAA designation process now underway, or in the future when the management plan for the NERR is updated. As part of the designation, NOAA will conduct a review of the nominated boundaries to evaluate their appropriateness for inclusion in the NERR, and also examine appropriate alternatives that have been suggested during the NEPA scoping and public information meetings on the proposed designation and content of the draft management plan. The draft management plan will include a description of the project site and the proposed boundaries. The public will be able to provide comments on suggested changes for consideration by OP and NOAA. The plan also includes a section on land acquisition that identified lands that may be appropriate for acquisition (or de-designation if no longer useful) in the future. Management plans are updated every five years and new boundary considerations can be proposed, evaluated, and included in the management plan and implemented as part of the site’s ongoing management actions.

Q. *Why has the proposed boundary for the NERR changed?*
A. The boundary was first proposed by the He‘eia community partners as part of their site proposal in April, 2013 (Figure 2). Based on input from private landowners to the south of the proposed boundary that the boundaries seemed to overlap with their property, the Office of Planning refined the boundaries. In refining the boundaries, some potentially appropriate areas in the wetland area and in Kāne‘ohe Bay were omitted from the area and the error was not caught by any of the reviewing parties. This was an oversight on the part of Office of Planning. The site partners have identified those areas, including the four fringing reefs in Kāne‘ohe Bay and upland portions of the Hawai‘i Community Development Authority property for consideration in the current process. Suggestions on alternative

boundaries are being evaluated in the NOAA designation process and in the development of the management plan. Additionally, the management plan has a section on Land Acquisition that can identify and consider changes in the boundaries as part of future management actions. If you have a suggestion about areas to include or exclude in the NERR boundary, please submit it using the Written Comment Form.

Figure 2. Original He'eia NERR site boundaries proposed by the He'eia site partners for the site selection process in April, 2013.

Q. *Why does the proposed NERR include coral reefs and a portion of Kāne'ohe Bay?*
A. Any area designated as a NERR needs to be a representative estuarine ecosystem that includes the diversity of fauna, flora, and natural processes occurring within the estuary. To encompass the diversity of the He'eia estuary, representative areas of upland forested-watersheds, streams, wetlands, fish pond, marine and coral habitats have been included in the proposal. This range of habitats provides all the essential elements of the estuary necessary to research and understand how all function together productively and sustainably.

Q. *Are commercial fishing interests included in the planning process? Is the fishing community being included in the development of the management plan?*
A. The fishing community, both the commercial and recreational fishers are welcomed and encouraged to participate in the planning process and development of the management plan. The planning process is open and transparent. A total of 10 meetings are taking place during this phase of the designation process, and are open to fishermen and the fishing community to participate. These meetings include 2 scoping meetings on the Draft EIS and Draft management plan, 6 focus group meetings, and 2 public

hearings for soliciting comments on the draft management plan and draft EIS. The Office of Planning also maintains a website with additional background information, draft documents, summaries of public comments, responses to frequently asked questions, notices of meetings and ways to provide input. Visit the website at http://planning.Hawai‘i .gov/czm/initiatives/nerrs-site-proposal-process/.

Q. *Who are the partners involved in the project, and can new partners be added?*
A. Five site partner organizations did much of the initial work developing the concept, proposal and documentation to propose He‘eia as a NERR site in Hawai‘i. The site partners are Ko‘olaupoko Hawai‘i an Civic Club, Kāko‘o ‘Ōiwi, Hawai‘i Institute of Marine Biology, Paepae o He‘eia , and Kama‘āina Kids/He‘eia State Park. Collectively, they are engaged in research, education, restoration and protection of the He‘eia estuary. Other entities involved in developing and supporting this project include Papahana Kualoa, The Nature Conservancy, Conservation International, and state and federal agencies. Expanding and nurturing partnerships with community groups is a common goal of NERRS across the country and will likely be one of the new He‘eia NERR.

Q. *Where is the money coming from to fund this project?*
A. The major source of funds for this project will come from the federal partner, NOAA and its National Estuary Research Reserve Program and the State of Hawai‘i, through the state agency management partner to support the NERR. In recent years, approximately $500,000 in federal funds has been available to each NERR site each year to carry out program activities. A 30% state match is required and could come from direct funding by state agencies, or staff salaries to coordinate the education, research and management activities of the NERR. NERR sites in other states have also leveraged private funding, which amplifies modest public investment. Additionally, approximately $4 million per year of competitive funding is available through the NERRS Science Collaborative, for researchers at NERR sites across the country. This funding does not currently come to Hawai‘i.

Q. *What State agency will be the management partner and implementing agency for the He‘eia NERR?*
A. The He‘eia NERR is expected to be managed by University of Hawai‘i (UH), Hawai‘i Institute of Marine Biology with oversight from NOAA. A draft Memorandum of Understanding (MOU) between UH and NOAA will be developed as part of the Management Plan as well as an MOU between UH and the additional landowners and managers involved in the area included in the NERR.

ADDITIONAL QUESTIONS AND ANSWERS REGARDING THE SITE SELECTION CRITERIA USED IN EARLY 2013

Q: *What is Criterion #16 (potential to generate revenue in order to support NERR activities) trying to get at?*
A: The selected NERR site in Hawaii will have a number of educational and research activities taking place on-site. In order to ensure continuity of these activities, it is desirable to have some way that the site can support itself when established. Other NERRS sites across the country offer guided tours, have small gift shops for souvenirs or have lab facilities that can be rented by visiting scientists for research purposes. These and other potential sources of funds will be considered during the development of the management plan of the site. Revenue generating activity is secondary to NERRS science and stewardship programs.

Q: *Do all sites need to have the four components listed in Criterion #8?*
A: No. The sites will be evaluated according to scoring point A, which assigns higher points to a more diverse site. The components listed in criterion #8 are an example of a highly diverse site with all four of these components. Another site may also be considered very diverse if the site includes shrublands, intertidal sand flats, and subtidal plants. A list of possible ecosystem types and physical characteristics can be found in Appendix 2 of the NERRS Program Regulations (15 CFR Part 921).

Appendix J. Memorandum of Understanding between National Oceanic and Atmospheric Administration (NOAA) and University of Hawai‘i (UH), Hawai‘i Institute of Marine Biology (HIMB)

Memorandum of Understanding for the Management of the He‘eia National Estuarine Research Reserve

Between

Office for Coastal Management, National Oceanic and Atmospheric Administration

And

Hawai‘i Institute of Marine Biology,
University of Hawai‘i

This Memorandum of Understanding (“MOU” or “Agreement”)) is entered into by the Office for Coastal Management, National Oceanic and Atmospheric Administration, (“OCM”) and the University of Hawaii on behalf of its Hawai‘i Institute of Marine Biology (“HIMB”) an organized research unit within the School of Ocean and Earth Science and Technology, University of Hawai‘ii at Manoa for the purpose establishing a cooperative framework for the management of the He‘eia National Estuarine Research Reserve (He‘eia NERR).

RECITALS

The Governor of the State of Hawai‘i determined that the waters and related coastal habitats of He‘eia estuary within Kāne‘ohe Bay, Island of O‘ahu, provide unique opportunities for the study of natural and human processes to contribute to the science of estuarine ecosystem processes, enhance environmental education opportunities, and provide scientific information for effective coastal zone management in the State of Hawai‘i.

The Governor determined that the citizens of Hawai‘i and the United States will benefit if the resources of the He‘eia estuary were managed as part of the National Estuarine Research Reserve System administered by OCM. Accordingly, by a letter dated May 21, 2014, former Governor Abercrombie nominated the He‘eia estuary and related lands for inclusion in the National Estuarine Research Reserve System.

The National Oceanic and Atmospheric Administration (“NOAA”) concurs with the Governor’s determination and recommendation, and pursuant to its authority under Section 315 of the Coastal Zone Management Act of 1972, as amended (CZMA, 16 U.S.C. § 1461), and in accordance with implementing the regulations at 15 C.F.R. § 921.30, intends to designate the He‘eia estuary and related coastal habitats as the He‘eia NERR.

As part of the designation process, NOAA is conducting an environmental review and assessment pursuant to NEPA and will, in collaboration with the State of Hawai’i, finalize an environmental impact statement (NOAA EIS) prior to designating the He’eia NERR.

Former Governor Abercrombie also designated the Office of Planning as the lead agency for the site selection process. This also included coordinating the drafting of a “Management Plan” for the He‘eia NERR. This sets forth the goals, objectives, strategies, actions, administrative structure, and institutional arrangements for the He‘eia NERR. Per 15 C.F.R. § 921.30(a)(4), approval of the Management Plan by NOAA is a prerequisite to designation of the He‘eia NERR.

The University of Hawai‘i, through its HIMB, has been designated by the Governor to be the lead state agency to coordinate the management of He‘eia NERR in accordance with Section 315 of the Coastal Zone Management Act and the Management Plan. HIMB acknowledges the values of state and federal cooperation and agrees to promote the long-term management of the He‘eia NERR in a manner consistent with the purpose of its designation.

To set forth a framework for the long-term, cooperative management and administration of He‘eia NERR, including a specification of respective duties and responsibilities, the parties hereby agree as follows:

AGREEMENT

A. Roles and Responsibilities of the Hawai‘i Institute of Marine Biology for He‘eia NERR

1. In the conduct of its performance regarding the management of He‘eia NERR, HIMB shall comply will applicable federal laws and regulations.

2. HIMB shall promote the protection of the natural and cultural resources of He‘eia NERR, and shall assist and cooperate with other governmental agencies that have enforcement or regulatory powers over the He‘eia NERR.

3. HIMB shall work cooperatively with other governmental agencies, non-profit organizations and community groups to ensure adequate, long-term protection and management of lands and waters within the Hawai‘i NERR boundaries.

4. HIMB shall request or apply for funds to support the administration and management of He‘eia NERR, and shall expend such funds as made available to HIMB in accordance with the He‘eia NERR Management Plan, the annual funding guidance from OCM, and the specific conditions and limitations of the funding. The budget request and expenditures shall be made in accordance with state budget and execution policies and procedures and in accordance with the University of Hawaii’s internal fiscal and accounting procedures.

5. HIMB shall conduct and coordinate research and monitoring programs that encourage scientists from a variety of institutions to work together to understand the ecology of the reserve ecosystem to improve coastal management.

6. HIMB shall conduct and maintain programs that disseminate research results via materials, activities, workshops, and conferences to resource users, state and local agencies, school systems, general public, and other interested parties.

7. HIMB shall provide initial start-up staff and endeavor to secure state funding, or private funding if appropriate, to support the costs of more permanent administrative staff. The parties envision the He‘eia NERR staff consisting of at least a manager, an education coordinator, and a research coordinator. Upon written agreement, the parties may agree to an expanded staff for the He‘eia NERR.

8. HIMB shall endeavor to obtain facilities and equipment to implement the Management Plan.

9. HIMB shall endeavor to obtain funding to support facilities operations and maintenance.

10. HIMB shall endeavor to obtain funds to support land acquisition and construction of facilities, consistent with the goals and objectives of the NERR system and the He‘eia NERR Management Plan.

11. HIMB shall maintain effective liaison with local, regional, state, and federal policy makers, regulators, and the general public.

12. HIMB shall be the principal point of contact and coordinator for any proposed boundary changes to the He‘eia NERR or amendments to the Management Plan.

13. HIMB shall coordinate state agency responses to NOAA’s requests for information made pursuant to Section 312 of the CZMA, particularly cooperative agreement and grant progress reports and evaluation findings. Such state agency responses to NOAA requests for information shall include descriptions of any actions or recommendations deemed by the state agency to be necessary to address any progress report or evaluation finding deficiencies. Where possible and appropriate to the organizational and legal authority of HIMB, HIMB shall implement any necessary actions and recommendations.

14. HIMB acknowledges the requirements of 15 C.F.R. § 921, specifically section 921.21(e), which specify the legal documentation required for the use and disposition of real property acquired for He‘eia NERR purposes with federal funds under Section 315 of the CZMA.

B. Roles and Responsibilities for Office for Coastal Management, NOAA

1. OCM shall administer the provisions of the Sections 312 and 315 of the CZMA to ensure that the reserve operates in accordance with goals of the reserve system and the He‘eia NERR Management Plan.

2. OCM shall review and process applications for financial assistance from HIMB, consistent with 15 C.F.R. Part 921, for management and operation of the He‘eia NERR, and, as appropriate, land acquisition and facility construction.

3. OCM shall advise the HIMB of existing and emerging national and regional issues that have bearing on the reserve and reserve system.

4. OCM shall maintain an information exchange network among reserves, including available research and monitoring data and educational materials developed within the reserve system.

5. OCM shall to the extent possible, facilitate the allocation of NOAA resources and capabilities in support of reserve goals and programs.

6. OCM shall schedule periodic evaluations of HIMB’s performance in meeting the terms of this Agreement, financial assistance awards, and the reserve management plan. Where findings of deficiency occur, NOAA may initiate action

in accordance with the designation withdrawal or interim sanctions procedures established by the CZMA and applicable regulations at 15 C.F.R. § 921.40-41.

C. General Provisions

1. Obligations Subject to Funding. All obligations and duties required of either party to this MOU shall be subject to and implemented only to the extent that funds have been properly appropriated or authorized thereto, and the funds have been released and allocated in accordance with state or federal budget execution policies. Nothing in this MOU or subsequent financial assistance awards shall obligate either party to perform its duties specified herein in the absence of funding support.

2. Financial Assistance Subject to Further Documentation. Any financial assistance awarded to University of Hawaii to implement this Heeia NERR project shall be processed, documented, and administered in accordance with customary University of Hawaii policies and procedures for receiving federal grants and contracts, or in accordance with policies and procedures to receive state funds or private financial support, as the case may be. Any financial assistance awarded by NOAA shall be processed, documented, and administered in accordance with and subject to customary NOAA policies and procedures for the award of financial assistance.

3. Free Exchange of Research Data. The parties are encouraged to freely exchange research and assessment data, as consistent with University of Hawai‘i policies on academic research, instruction and publication, and with any applicable state or federal laws. NOAA understands that HIMB’s primary mission is education and the advancement of knowledge and research. HIMB views its activities under this MOU as supporting that mission. HIMB may use, exchange, share and publish research information generated from this project as consistent with customary public university academic practices, including attribution and acknowledgement of funding sources, where necessary. HIMB and NOAA shall disclose government records concerning this MOU as required by applicable state and federal law.

4. Non-Impairment of Pre-Existing Legal Authority. Nothing in this Agreement diminishes the independent authority or responsibility of either party in administering its respective statutory obligations. Nothing in this Agreement is intended to conflict with current written directives or policies of either party. If the terms of this Agreement are inconsistent with existing written directives or policies of either party entering this Agreement, then those portions of this Agreement which are determined to be inconsistent with such written directives and policies

shall be invalid; but the remaining terms not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this Agreement, all necessary changes shall be made by either an amendment to this Agreement or by terminating this Agreement and entering in a new superseding agreement, whichever is deemed expedient to the interested parties.

5. Dispute Resolution. Should disagreement arise on the interpretation of the provisions and/or amendments of this Agreement, such disagreement shall be resolved by negotiations at the operating level of each party. If such disagreement cannot be resolved, then the areas(s) of disagreement shall be stated in writing and presented to the other party for further consideration. If agreement is not reached within thirty (30) days of presentation, then the parties shall forward the written presentation of the disagreement to their respective higher official for appropriate resolution.

6. Effective Date. Upon the signature of both parties, this Agreement shall be deemed effective as of the date of NOAA’s designation of the He‘eia NERR.

7. Amendments. This Agreement will be reviewed periodically by both parties and may be amended by the mutual written consent of both parties.

8. Regulatory Authority. Nothing in this Agreement adds to the regulatory powers or enforcement authority of either party that may have existed prior to the effective date of this Agreement.

9. Early Termination Prior to Expiration. This Agreement may be terminated (a) by mutual consent of both parties, or (b) by NOAA if NOAA withdraws designation of the reserve within the reserve system, pursuant to applicable provisions of the CZMA and its implementing regulations as described under 15 C.F.R. Part 923, Subpart L, or if NOAA finds, in its sole discretion, that Hawaii Institute of Marine Biology fails to comply with this MOU, or (c) by HIMB if HIMB determines, in its sole discretion, it is no longer capable of fulfilling its obligations under this Agreement or the Management Plan.

10. Disposition of Funds and Equipment upon Termination. Should this Agreement be terminated, reimbursement of unexpended funds from financial assistance awards shall be determined on a pro rata basis according to the amount of work done by the parties at the time of termination. Additionally, reimbursement for land purchased and facilities constructed with NOAA funds shall be consistent with terms and special award conditions of financial assistance awards.

11. Upon termination of this Agreement or any subsequent financial assistance awards to HIMB any equipment purchased for studies to further this Agreement will be disposed of in accordance with 15 C.F.R. § 24.32.

12. Severability If any clause, sentence or other portion of this MOU shall become illegal, null, or void for any reason, the remaining portions of this MOU shall remain in full force and effect.

13. Waiver Must be in Writing. No waiver of right by either party of any provision of this MOU shall be binding unless expressly confirmed in writing by the party giving the waiver.

14. No Third Party Rights. This MOU establishes benefits and obligations between the parties to this MOU. Nothing in this MOU shall be interpreted or construed to provide standing to any person or organization who is not a party to this MOU, acting either in their own capacity or on behalf of any party, to demand performance of any duty or responsibility set forth this MOU. Nor shall this MOU confer standing to any person or organization who is not a party to this MOU to claim benefits provided in this MOU in their own right or on behalf of a party to this MOU.

Executed by OCM

By _____
Its

Date_____

Executed by the University of Hawaii, on behalf of its Hawaii Institute of Marine Biology

By _____
Director, Hawaii Institute of Marine Biology

By _____
Dean, School of Ocean and Earth Sciences and Technology

By _____

Chancellor, University of Hawaii, Mānoa

Date_____

Appendix K. Multi-Party Governance Charter between Landowners and Managers in the He‘eia NERR

Draft dated December 6, 2016

Governance Charter For the He‘eia National Estuarine Research Reserve at He‘eia, O‘ahu, Hawai‘i.

This Governance Charter establishes the organizational framework for interested parties to participate in and coordinate their efforts to advance the mission of the He‘eia National Estuarine Research Reserve (“NERR”) at He‘eia, O‘ahu, Hawai‘i.

Preamble

The State of Hawai‘i (“Hawai‘i”) determined that the waters and related coastal habitats of He‘eia estuary within Kāne‘ohe Bay, Island of O‘ahu, provide unique opportunities to study the natural and human processes of an estuarine ecosystem, to expand environmental education, and to develop research-based information for effective coastal zone management in the State of Hawai‘i.

The National Oceanic and Atmospheric Administration (“NOAA”) concurred with the State’s determination. Pursuant to its authority under Section 315 of the Coastal Zone Management Act of 1972, as amended (CZMA, 16 U.S.C. § 1461), and in accordance with implementing the regulations at 15 C.F.R. § 921.30, NOAA intends to designate the He‘eia estuary and related coastal habitats as the He‘eia National Estuarine Research Reserve (“NERR”).

The former Governor’s nomination process to include the He‘eia lands in the national estuarine research reserve system received broad public support through the site selection and site nomination phases. Various organizations, including public agencies of the State of Hawai‘i, non-profit organizations, community groups, and other interested parties strongly support the purpose for the NERR and desire to participate in its program activities once the NERR becomes formally designated.

Hawai‘i and NOAA believe that state and federal agencies, non-profit organizations, community groups, and private entities could more effectively collaborate as partners in the stewardship of the He‘eia estuary if there were an organizational structure with clear protocols based on common operating assumptions and participatory decision making.

This multi-party governance Charter for the He‘eia National Estuarine Research Reserve at He‘eia, O‘ahu, Hawai‘i, is therefore established as follows.

Article I

NERR Site

Section 1. Current NERR Site Boundaries. The He‘eia NERR includes the estuary, wetlands, marine waters, and upland areas. The total acreage of the He‘eia NERR is approximately 1,385 acres. It encompasses He‘eia State Park to the north, He‘eia Fishpond in the center, wetlands to the west and south, the University of Hawai‘i’s (UH) Hawai‘i Institute of Marine Biology (HIMB) property on Moku o Lo‘e (Coconut Island) to the east, and a large expanse of marine waters with patch and fringing reefs. These lands were selected for inclusion because of the support from the respective landowners, the adequacy of current oversight by state agencies, and because the land exhibits characteristics suitable for long-term estuarine research, education and interpretive activity. *See He‘eia NERR Management Plan, Figure 1.3, Location of the He‘eia NERR, Figure 1.4, Land Ownership in He‘eia NERR, and Table 1-1, Landownership, Managing Entity, and Acreage of Properties.*

Section 2. Future NERR Site boundaries. This Charter shall be amended from time to time to reflect modifications to the NERR boundaries. Potential future changes to the NERR are outlined in the He‘eia NERR Management Plan. *See He‘eia NERR Management Plan Section 9, Land Acquisition Plan.* The boundary modification process is delineated by NOAA.

Article II

Management Plan, Strategic Plan, and Site-Specific Activities

Section 1. Site Management Plan. A site management plan has been developed for the NERR that outlines specific research, monitoring, education, training, and stewardship activities at the NERR. *See He‘eia NERR Management Plan, Section 4 Reserve System Program Foundations.*

a. Unique Approach. The plan for the NERR presents an opportunity to honor the past by using the traditional ecosystem management approach embodied in ahupua‘a principles, integrated with contemporary principles of the NERR System and evaluated through the ecosystem services provided to sustainably manage the He‘eia estuary.

a. Adaptive Management Characteristics of Plan. As more information becomes available, the NERR management plan may be amended to adapt to the new information through annual and required 5-year comprehensive reviews. Incorporating the latest data into the decision-making process will assist He‘eia NERR staff and the Reserve Advisory Board (*See Article IV*) to more effectively assess and evaluate staffing, facilities, and program needs.

b. Purpose of the Management Plan. The purpose of the Management Plan is to provide funding, staff, and other resources and guidance that will assist NERR land managing entities to develop and sustain site-specific activities that are consistent with the goals of the NERR.

Section 2. Strategic Plan. The NERR Strategic Plan outlines the NERR Vision and Mission, as well as the Primary Research Question for the He‘eia NERR. The NERR Strategic Plan relates the NERR goals, objectives, and priority coastal management issues to broader State and federal priorities. *See He‘eia NERR Management Plan, Section 3 Reserve Strategic Plan.*

Section 3. Site-Specific Activities. Multiple uses of NERR lands are encouraged to the extent that such uses are compatible with the vision, mission, goals, and objectives of the site partners as expressed in the management plan. The charter participants having jurisdiction over the NERR lands will exert their reasonable best efforts to ensure uses or levels of use are consistent with the goals of the management plan.

Section 4. Education and Public Disclosure

A free exchange of data and information among the charter participants is encouraged to ensure the success of these cooperative activities.

Article III

Charter Participants

Section 1. The benefits and privileges of this Charter shall be available to organizations that have signed a Participation Agreement. *See attached Draft Template for Participation Agreement.*

Section 2. Charter Participants. For administrative convenience, the charter participants and their general responsibilities can be grouped into the following categories:

A. Lead State Agency: University of Hawai‘i, Hawai‘i Institute of Marine Biology (“HIMB”). The State has designated HIMB, an independent research unit within the University of Hawai‘i to be the lead State agency for the NERR. The duties and responsibilities of HIMB as lead state agency are described in a Memorandum of Understanding (MOU) between NOAA and HIMB. *See He‘eia NERR Management Plan, Appendix J.*

The primary mission of HIMB is to conduct multi-disciplinary research and education in all aspects of tropical marine biology. HIMB continues to be a world leader in research to understand and conserve tropical marine ecosystems. As such, HIMB faculty and staff develop and implement new technologies that advance the informed stewardship of Hawai‘i’s marine and coastal biodiversity. Consequently HIMB may continue similar research and educational activities on other projects. HIMB may use, publish, and disclose data, information, or writings generated by activities under the Program.

HIMB may discuss its activities under the NERR with other entities and individuals.

B. State Landowners: Department of Land and Natural Resources, Hawai‘i Community Development Authority

a. Department of Land and Natural Resources (DLNR) is responsible for managing, administering, and exercising control over public lands, water resources, ocean waters, navigable streams, coastal areas (except commercial harbors), minerals, and all

interests therein. Divisions within DLNR, including Division of Aquatic Resources, Division of Boating and Ocean Recreation; Division of Conservation and Resource Enforcement; Division of Forestry and Wildlife, State Parks; and Office of Conservation and Coastal Lands, are involved with specific tasks related to their statutorily assigned responsibilities. These may apply to activities within the He‘eia NERR, although the designation of the NERR does not change these responsibilities. The He‘eia State Park is owned and managed by DLNR. DLNR may discuss its activities under the NERR with other entities and individuals.

b. Hawai‘i Community Development Authority (HCDA) is a State agency that was established to supplement traditional community renewal methods by promoting and coordinating public and private sector community development. The HCDA is the local redevelopment authority of the He‘eia district to facilitate culturally appropriate agriculture, education, and natural-resource restoration and management of the He‘eia wetlands. The designation of the NERR does not change these responsibilities. HCDA may discuss its activities under the NERR with other entities and individuals.

C. Privately Held Land Manager: Paepae o He‘eia is a private non-profit organization dedicated to caring for He‘eia Fishpond. Paepae o Heeia’s mission is to implement values and concepts from the model of a traditional fishpond to provide intellectual, physical, and spiritual sustenance for their community. Paepae o He‘eia entered into a license agreement for the fishpond with landowner Kamehameha Schools. The designation of the NERR does not change the responsibilities Paepae o He‘eia has to Kamehameha Schools. Paepae o He‘eia may discuss its activities under the NERR with other entities and individuals.

D. Future partners

Organizations wishing to join the He‘eia NERR as a Governance Charter participant may do so by signing a Participation Agreement and submitting it to the Reserve Advisory Board for their review. The Reserve Advisory Board will make a determination regarding the acceptance of any additional participants to join the He‘eia NERR. *See attached Draft Template for Participation Agreement.*

Article IV

Advisory Board and Committees

Section 1. Reserve Advisory Board. The policies, activities, and programs of the He‘eia NERR will be developed and implemented with input from the Reserve Advisory Board (RAB). The RAB will be created upon designation of the He‘eia NERR. RAB Bylaws shall be developed and adopted after the Board is created.

a. Board membership. The Board shall consist of members from the entities listed in Article III Section 2 who have signed written Participation Agreements as well as additional entities including Ko‘olaupoko Hawaiian Civic Club, Ko‘olau Foundation, Kāko‘o ‘Ōiwi, and The Nature Conservancy. Each entity shall have one representative on the Board.

Board terms shall be of three years duration, commencing upon designation of the He‘eia NERR and ending three years thereafter, excluding initial partial year appointments. The Board may vote to stagger the years when Board terms end. Any party may substitute its representative at any time, to serve the balance of the three year term. New Board members affiliated with new participants may be added to the Board by a majority vote. Board member term limits may be adopted by the Board in their Bylaws.

b. Board role. The Board shall act on behalf of the agencies/entities having jurisdiction over sites comprising the NERR and/or an operational interest in the NERR. Members of the Board will serve without compensation from the NERR. In addition, the purpose of the Board is to advise the lead State Agency, HIMB, regarding implementation of the He‘eia NERR Management Plan. The Board shall review the Plan at least every five (5) years and shall advise the lead State Agency regarding modification of the Plan.

c. Board meetings. Board members will be provided notice ten (10) working days in advance of a meeting. Fifty percent (50%) plus one (1) member of Board members present in person or by proxy shall constitute a quorum for transaction of business at all meetings of the Board. Each member of the Board will have one vote in decisions put before the Board. The system by which the RAB shall make decisions shall be adopted by the Board in their Bylaws. A minimum of 4 meetings per year shall be held, and a schedule for these meetings shall be developed and adopted by the Board in their Bylaws.

Section 2. Advisory Committees

The Board may create committees or subcommittees to provide technical information or linkage to the broader community pertaining to the three main missions of the NERR Program (Program): research, education, and stewardship. Members of committees or subcommittees will serve without compensation from the NERR.

a. Kūpuna Advisory Committee. The He‘eia NERR Reserve Manager and RAB may establish a Kūpuna Advisory Committee to provide cultural guidance to the Board on cultural protocols, Native Hawaiian traditional and customary practices either within the He‘eia NERR or within the ahupua‘a of He‘eia, or any other relevant and appropriate cultural information. The Kūpuna Advisory Committee shall be composed of Kūpuna or cultural practitioners familiar with the ahupua‘a of He‘eia or its cultural resources.

b. Research Advisory Committee. The He‘eia NERR Reserve Manager and RAB may establish a research advisory committee to coordinate and provide input on the He‘eia NERR’s research and monitoring program. This group will be chaired by the He‘eia NERR Research Coordinator and be composed of research staff from the RAB, federal and state agency staff, and visiting researchers who have an interest in the He‘eia NERR research program.

c. Education Advisory Committee. The He‘eia NERR Reserve Manager and RAB may establish an education advisory committee to coordinate and provide input on the He‘eia NERR’s education programs. This group will be chaired by the He‘eia NERR Education Coordinator and be composed of education staff from the RAB; federal and state agency staff; teachers and administrators representing a variety of levels, geographic areas, and subjects; and visiting educators who have an interest in the He‘eia NERR education program. The group

can provide community input and planning support for developing and implementing NERRS education programs such as TOTE and KEEP. Cultural educators may also sit on the education advisory committee to ensure cultural aspects are considered in developing education programs at the He‘eia NERR.

d. Cultural Resource Committee. The He‘eia NERR Reserve Manager and RAB may establish a cultural resource committee to coordinate and provide input on cultural aspects of He‘eia NERR programs. The group will be co-chaired by the He‘eia NERR Cultural Resource Coordinator and NERR Stewardship Coordinator, and be composed of members from the RAB, cultural practitioners, and those whose families have lineal and cultural connections to the ahupua‘a of He‘eia, as well as cultural educators.

Section 3. NERR Staff. HIMB may hire and direct NERR staff, supervising and coordinating implementation of the provisions of the Management Plan. HIMB may enter service orders with the Research Corporation, University of Hawai‘i, where appropriate, to hire employees or provide equipment and supplies. The NERR staff will be directly responsible for Program coordination with agency/entity representatives having jurisdiction over areas within the NERR boundary. HIMB’s obligation to implement the Plan is contingent upon continued receipt of Grants or other appropriations for the purpose of operating the Program.

Section 4. The NERR staff, Board, and appropriate advisory participants shall confer regularly to ensure coordination between the NERR and the broader goals and mandates of regional coastal management programs that affect the NERR.

Article V

Funding and Financial Management

A primary purpose of the Program is to provide funding, staff, and other resources and guidance to conduct site-specific activities that are consistent with the Plan.

Section 1. Initial Grant. Upon designation, HIMB will receive a grant (“Grant”) from NOAA to be used for the implementation of the Management Plan. This grant will be matched with State general funds.

Section 2. Subsequent Funding. Subsequent funding received from NOAA will be matched by the State in the form of 3 positions to meet the required match level rate pursuant to the Code of Federal Regulations (CFR) §921.32.

Section 3. Funding Subject to Availability of funds. All financial commitments by NOAA, the lead State Agency and all partners to implement the Management Plan are subject to the appropriate legislative bodies authorizing and appropriating the necessary funds, and the executive budgetary process releasing those funds to the charter partners.

Nothing in this Charter or subsequent financial assistance awards shall obligate any party-in-interest in the expenditure of funds, or for future payments of money, in excess of appropriations authorized by law.

Article VI

Relationship of this Charter to Pre-Existing Legal Obligations

Section 1. Preserving existing statutorily conferred authority or obligations. Nothing in this Charter diminishes the independent authority or coordination responsibility of any party in administering its respective statutory and legal obligations. Nothing in this Charter is intended to conflict with current written directives or policies of any party. If the terms of this Charter are inconsistent with existing written directives or policies of any party at the time the party agrees to this Charter, then those portions of the Charter that are determined to be inconsistent with such pre-existing written directives and policies shall be invalid as to that party; but the remaining terms not affected by the inconsistency shall remain in full force and effect.

Section 2. No NERR projects shall be carried out on NERR lands without appropriate permits, meeting of regulatory requirements, and/or the approval of the agency/entity having jurisdiction over such lands.

Section 3. All government entity participants in NERR activities shall comply with all applicable federal, state, and county laws regulating ethical conduct of public officers and employees.

Section 4. Each charter partner shall comply with all applicable laws, regulations, and executive orders to provide Equal Employment Opportunities. *[note: awaiting input from NOAA regarding this section]*

Section 5. Each charter partner shall observe all applicable laws, regulations, and executive orders respecting Native Hawaiian customary rights.

Article VII

Liability and Waivers

Section 1. No waiver of sovereign immunity. Nothing in this Charter or its attached Participation Agreement shall be construed to waive sovereign immunity nor expand the waivers provided under current law concerning the University or Hawai‘i or any State of Hawai‘i public agency.

Section 2. No new rights to sue or causes of action created. This Charter is designed for the convenience of the charter participants. The Charter by itself does not create additional causes of actions or legal rights enforceable in a court of law. No participant in NERR activities shall be liable for any incidental, indirect, special or consequential damages arising out of their performance of the activity. No party shall be liable for delays in performing obligations arising from this Charter due to factors beyond the reasonable control of such party.

Section 3. This Charter shall not be construed to provide any express or implied warranties of merchantability, fitness for a particular purpose, freedom of infringement, or any other warranties of any kind or nature.

Article VIII

Internal Dispute Resolution Process

Any ambiguity in the text of this Charter shall be construed in accordance with its fair meaning, without regard to any presumption for or against any party.

If a dispute arises among charter participants concerning the intent or effect of this Charter or its attached Participation Agreement, the parties must make good faith efforts to informally resolve their differences.

If a mutually satisfactory resolution is not reach after good faith attempts, the dispute may be submitted to the Reserve Advisory Board for resolution by majority vote of all members to which the Board is entitled.

If any party objects to the Board’s disposition of the matter, the objecting party must state its objections in writing and propose a disposition which it will accept. The Board shall either reconsider its decision, or it may affirm its decision and submit the controversy including the statement(s) of objections to a mediator approved by the majority of the Board. The mediator may discuss the matter with all parties and attempt to mediate a mutually satisfactory compromise. If mediation fails, any party may pursue other legal remedies and may, in addition, immediately terminate participation in this Charter.

Article IX

Duration and Amendments to this Charter

Section 1. This Charter shall continue on an on-going basis so long as the NERR is funded and remains viable, as jointly determined by the lead State Agency and NOAA.

Section 2. This Charter may be terminated by a majority vote of the Board.

Section 3. This Charter may be amended by majority vote of the Board, provided that the proposed amendment is introduced and discussed at a duly noticed meeting, and adopted only at a subsequent duly noticed meeting.

Section 4. Survival of Terms. Those provisions of this Charter which by their nature extend beyond termination or expiration of this Charter shall survive such termination or expiration.

Article X

Withdrawal from Participation

Withdrawal from Participation. Any party, at any time, may elect to withdraw from further participation in this Charter.

Effect of withdrawal on land. Upon withdrawal, the lands of the withdrawing party would be removed from designation as NERR lands.

Effect of withdrawal on funding. If the withdrawing party has received federal awards related to the implementation of the NERR Management Plan, the withdrawing party will notify appropriate federal agencies to implement appropriate mediation or termination of current or pending grants.

Effect of withdrawal on ownership of equipment or supplies. Upon withdrawal, title and ownership of any equipment purchased by a party for activities initiated in furtherance of the mission of the NERR will be determined in accordance with the terms or conditions of the source funding the purchase.

Article XI

General Conditions

Section 1. Governing Law and Jurisdiction. This Charter shall be construed and enforced in accordance with the laws of the State of Hawai‘i, exclusive of its choice of law provisions, as well as any preemptive United States federal laws and regulations.

Section 2. Severability. If any clause, sentence or other portion of this Charter shall become illegal, unenforceable, or void for any reason, the parties shall attempt in good faith to continue to implement the remaining portions of this Charter to accomplish the mission of the NERR.

END of CHARTER

Attachment:

Draft Template for Participation Agreement

COMMITMENT TO PARTICIPATE

HE‘EIA NATIONAL ESTUARINE RESEARCH RESERVE (NERR)

He‘eia, O‘ahu, Hawai‘i

The undersigned party desires to participate in programs of the National Estuarine Research Reserve site at He‘eia, O‘ahu, Hawai‘i, and shares the NERR goals of:

(1) Increasing our understanding of the effects of human activities and natural events to improve informed decision making affecting the sustainable management of the He‘eia estuary, coastal ecosystems, and ultimately the entire ahupua‘a of He‘eia;

(2) Developing a place-based education and training program for the He‘eia NERR that inspires and educates the community about estuaries, coastal ecosystems, and traditional

Hawaiian practices, such as lo‘i and loko i‘a, that mālama (nurture) these systems sustainably; and

(3) Engaging various communities to create opportunities for collaboration to practice and promote stewardship that sustains cultural, biological, and natural resources.

Accordingly, we agree to abide by the Governance Charter for the He‘eia NERR, and pledge our reasonable best efforts to accomplish its mission.

Name of Organization: _____

Executed by: _____ (name)

Its _____ (title)

Date: _____

Appendix L. Existing Rules and Regulations Governing Activities and Uses in the Area of the Proposed He‘eia NERR

State Agency statute, rules and regulations

The statutes, rules and regulations that apply to resource conservation and management at the He‘eia NERR are listed below by State regulatory agency and topic. Pertinent sections are described below or if voluminous, a link to the rule is provided.

Department of Land and Natural Resources

1. Kaneohe Bay Regional Council (Hawai‘i Revised Statutes [HRS] 200D)
   http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0200D/HRS_0200D-.htm

2. Aha Moku Advisory Committee (HRS 171-4.5)
   http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0171/HRS_0171-0004_0005.htm

Office of Conservation and Coastal Lands

1. Conservation District. HAR Title 13, Chapter 5.
   http://dlnr.hawaii.gov/occl/files/2013/07/183C.pdf

Excerpts of Pertinent Information for He‘eia NERR

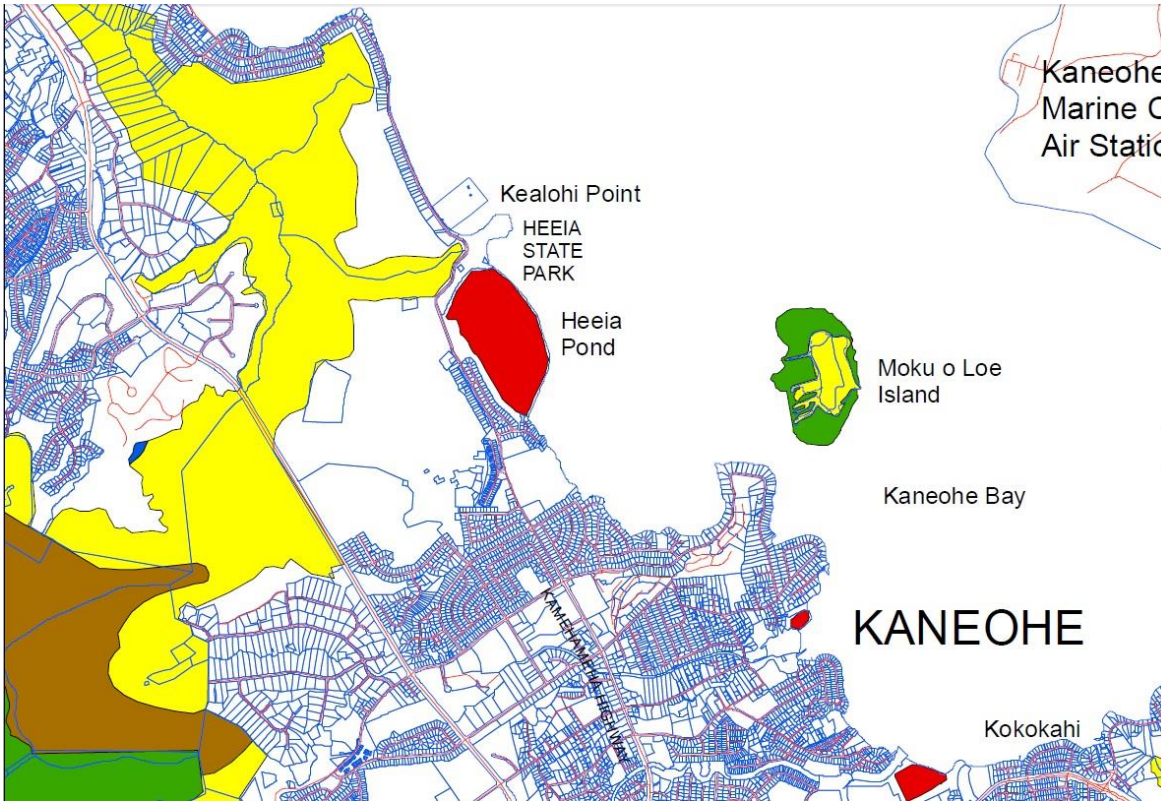
Division of Aquatic Resources

1. Hawai‘i State fishing regulations -General
   - Commercial Bait License (HRS 188-45)
   - Commercial Marine License (HRS 189-2.3)
   - Aquaculture License (HRS 187-3.5, HAR 13-74-43)
   - Aquaculture Facility License (HRS 187-3.5, HAR 13-74-43)
   - Special Activity Permit (HRS 187A-6)
   - Recreational Bottomfish Fishing Vessel Registration (HAR 13-94)
   - Commercial Fishing Vessel Registration (HAR 13-94)
2. Hawai‘i State fishing regulations Site-specific
   - He‘eia Kea Wharf (HAR 188-36)
   - Coconut Island (HAR 188-36)
3. Fisheries Resource Management
   - Lay nets (HAR §13-75.12.4)
   - Oahu Aquarium Life Management (HAR §13-77-1)
4. Protected Marine Fisheries Resources (HAR §13-83 to §13-95)
5. Protected Freshwater Fisheries Resources (HAR §13-100)
   http://dlnr.hawaii.gov/dar/administrative-rules/

HAR Title 13, Chapter 5, Conservation District. Rules regulating land uses within the State Land Use Conservation District. http://dlnr.Hawai‘i.gov/occl/files/2013/08/13-5-2013.pdf

CDUA permit (from DLNR OCCL) applying to conduct land uses within the State Land Use Conservation District (HRS Chapter 183C; HAR Title 13, Chapter 5)

Light yellow: Conservation District
- Bright yellow: General Subzone (Coconut Island)
- Brown: Limited Subzone
- Green: Protected Subzone (waters around Coconut Island)
- Red: Resource Subzone (fish pond)
- Blue: Special Subzone



Conservation District Subzones

Excerpts of Pertinent Sections of Hawai'i State Fishing Regulations

General Regulations

Commercial Bait License (HRS 188-45)	Any commercial marine licensee to use a small mesh net to take certain fish for use as live bait. Required: Commercial Marine License, Bait report.
Commercial Marine License (HRS 189-2.3)	Any person to take marine life for commercial purposes. Required: Catch report.
Aquaculture Facility License (HRS 187-3.5, HAR 13-74-43)	Any fish pond owner or operator to take regulated marine life, including young mullet, from the ocean, or to acquire regulated marine life from non-ocean sources, to stock their pond or facility with the intention of raising the marine life for commercial purposes. Required: Initial site inspection, Letter of authorization, Take report.
Special Activity Permit (HRS 187A-6)	Any individual associated with any research, educational, or management institution to collect aquatic life, or use certain fishing gear or methods, that are prohibited or restricted by regulations. Required: Reports.
Recreational Bottomfish Fishing Vessel Registration (HAR 13-94)	Any vessel owner to take or possess any of the Deep 7 bottomfishes. Vessel identification required.

Site-specific Fishing Regulations

He'eia Kea Wharf (HAR 188-36)	**Permitted:** To take any legal size fish in season with one line, or one rod and line, with no more than two hooks. To take crabs with not more than 10 nets, provided the nets are not more than two feet in diameter. To take shrimp for bait with a hand net, provided that the net is not more than three feet in any dimension. Commercial Marine licensees with a Bait License may take nehu, iao, and other authorized baitfish for bait purposes. Licensed pond owners or operators may take young mullet (pua) or other small fish for stocking their fishpond. **Prohibited:** To fish in or take aquatic life, except as indicated in permitted activities above.
Coconut Island (HAR 188-36)	**Permitted:** Unlawful to take any aquatic life from within the boundaries of the refuge. **Prohibited:** This restriction does not apply to any officer, faculty member, employee or student of the University of Hawai'i, or licensee of the Board of Regents of the University of Hawai'i while employed in catching or taking of aquatic life for scientific purposes. All authorized taking of aquatic life must follow minimum size and closed seasons for certain species, gear restrictions, etc.

Division of Boating and Ocean Recreation

1. Small Boat Harbors
   - Offshore Mooring Rules and Areas (HAR §13-235)
2. Boating (§13-240 to §13-245)
3. Ocean Waters, Navigable Streams & Beaches
   - General Provisions (HAR §13-250)
   - Local Ocean Waters (HAR §13-254)
   - Ocean Recreation Management Rules (HAR §13-256)

http://dlnr.hawaii.gov/dobor/rules/

Excerpts of Pertinent Sections of Hawai'i Boating and Ocean Recreation Statutes, Rules and Regulations

Rules for state waters:

HRS 200-4	vessels, access to boat ramps, harbors, etc.
HRS 200-10	permits/fees for state small boat harbor moorings
HRS 200-39	Kaneohe Bay activities, permits, restrictions (a) For the purposes of this section, "ocean use activities" means commercial operation of thrill craft, high speed boating, parasailing, water sledding, sailing and snorkeling tours, glassbottom boat tours, or any other similar commercial ocean recreation activity for hire. (b) Any other provision of this chapter to the contrary notwithstanding, no person shall operate thrill craft, parasailing, water sledding, or commercial high speed boating unless the person meets the requirements of section 200-37 and all rules adopted by the department that regulate or restrict these activities. (c) Permits issued by the department for the commercial operation of ocean use activities in Kaneohe Bay shall be limited to the number and locations, by permit type and vessel and passenger capacity, provided in the Kaneohe Bay master plan developed pursuant to Act 208, Session Laws of Hawai'i 1990, until applicable rules consistent with the master plan are adopted by the department; provided that the passenger capacity for snorkeling tours and glassbottom boat tours shall be set through rules adopted pursuant to chapter 91. No thrill craft permit may be transferred after June 21, 1998; provided that transfers of permits may be made at any time between family members. (d) On Sundays and federal holidays, all commercial ocean use activities shall be prohibited. (e) All rules adopted by the department with regard to Kaneohe Bay shall be drafted in consultation with the Kaneohe Bay regional council. For those provisions of the Kaneohe Bay master plan previously adopted by the legislature, the rules adopted by the department shall be in accordance with those provisions. Notwithstanding subsection (c) to the contrary, if the department determines for safety or environmental protection reasons that a permitted use should be relocated, the department may relocate the permitted use and the department shall have discretion to permit vessel

	substitution with a similar length vessel; provided that the increase is not greater than ten per cent of the current vessel length. For those provisions of the Kaneohe Bay master plan developed pursuant to Act 208, Session Laws of Hawai‘i 1990, not previously adopted by the legislature, the master plan shall be used as the recommended guideline in the adoption and implementation of rules with regard to the regulation of all activities in Kaneohe Bay. [L 1993, c 317, §§3(1), 7; am L 1998, c 4, §§2, 3 and c 129, §2; am L 2000, c 110, §1]

DLNR Ocean Recreation Management Rules and Area (HAR §13-256).

DLNR Offhore Mooring Rules and Areas

§13-235-35 Kaneohe Bay designated mooring areas "A", "B", "C" and "D". (a) The Kaneohe Bay designated mooring areas "A", "B", "C" and "D" means the areas confined by the boundaries shown for said mooring areas on Exhibits "G" and "H", dated, October 28, 1991, located at the end of this subchapter. The boundaries are as follows:

(2) Kaneohe Bay designated mooring area "B".

Beginning at a point on the water measured by azimuth clockwise from True South, 267 degrees for a distance of one thousand five hundred feet from the northern tip of the He'eia Kea Small Boat Harbor Pier; then 270 degrees for a distance of nine hundred feet; 360 degrees for a distance of one thousand five hundred seventy-five feet; 090 degrees for a distance of nine hundred feet; then on a straight line to the point of beginning.

(b) All vessels within Kaneohe Bay ocean waters shall be moored or anchored within a designated mooring area, except:

(1) Vessels moored in accordance with a permit approved by the board of land and natural resources and a U. S. Army Corps of Engineers permit as provided in section 13-235-9;

(2) Vessels moored in privately-dredged channels fronting private residences on February 3, 1992;

(3) Skiff and other small craft moored on fringing reefs or mud flats; and

(4) Vessels temporarily anchored for less than seventy-two hours in the immediate vicinity of Ahu o Laka Island (the "sand bar").

(c) Compliance is required within sixty days of receipt of written notice to the owner of a vessel to relocate to a designated mooring area.

(d) No person shall navigate, moor or anchor a commercial vessel providing service on a fee basis in a designated mooring area unless the vessel has been registered and the owner has a valid commercial use permit issued by the department to operate from He'eia Kea Small Boat Harbor, or is operating from a private boating facility or location for which an ingress or egress corridor has been established by the department. Unofficial Compilation

(e) No permanent mooring shall be installed within the designated mooring area except by permit issued by the department.

(f) No application for mooring for areas "C" and "D" shall be accepted unless the applicant can demonstrate acceptable public or private access to the shoreline, including adequate parking provisions. [Eff 2/24/94] (Auth: HRS §§200-1, 200-2, 200-3, 200-6) (Imp: HRS §§200-1, 200-2, 200-3, 200-6)

Division of State Parks

1. Hawai‘i State Park System (HAR Title 13, Chaper 146)

   http://dlnr.hawaii.gov/dsp/files/2015/04/hsp_13-146_har.pdf

Division of Forestry and Wildlife

1. Threatened and Endangered Plants (HAR Title 13, Chaper 107)
   http://files.hawaii.gov/dlnr/dofaw/rules/Chap107.pdf

2. Indigenous Wildlife, Endangered & Threatened Wildlife, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife (HAR Title 13, Chaper 124)
   http://dlnr.hawaii.gov/dofaw/files/2013/09/Chap124a.pdf

State Historic Preservation Division

1. Rules Governing Requirements for Archaeological Site Preservation and Development (HAR Title 13, Chapter 277)
   http://files.hawaii.gov/dlnr/shpd/rules/277.pdf
2. Rules Governing Procedures for Historic Preservation Review to Comment on Chapter 6E-42, HRS, Projects (HAR Title 13, Chapter 284)
   http://files.hawaii.gov/dlnr/shpd/rules/284a.pdf
3. Rules of Practice and Procedure Relating to Burial Sites and Human Remains (HAR Title 13, Chapter 300)
   http://files.hawaii.gov/dlnr/shpd/rules/300.pdf

Hawai‘i Community Development Authority

4. Heeia Community Development District (HRS 206E – 201 to 205)
   http://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0206E/HRS_0206E-0201.htm

Federal Agency Regulations

Army Corps of Engineers

Regulate impacts to wetlands, navigable waterways, discharge of fill material into waterbodies and wetlands

- Section 10 of the Rivers and Harbors Act of 1899 requires approval prior to the accomplishment of any work in, over, or under navigable waters of the United States, or which affects the course, location, condition or capacity of such waters.

http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/materials/rhsec10.pdf

- Navigable waters of the United States (33 CFR Part 329) are defined as waters that have been used in the past, are now used, or are susceptible to use as a means to transport interstate or foreign commerce up to the head of navigation. Section 10 and/or Section 404 permits are required for construction activities in these waters.
  Typical activities requiring Section 10 permits include:

  - Construction of piers, wharves, breakwaters, bulkheads, jetties, weirs, dolphins, marinas, ramps, floats, intake structures, and cable or pipeline crossings.
  - Installation of overhead utilities across navigable waters or installation of underground utility lines beneath navigable waters.
  - Work such as dredging or disposal of dredged material.
  - Excavation, filling, or other modifications to navigable waters of the U.S.

  http://www.gpo.gov/fdsys/pkg/CFR-2011-title33-vol3/pdf/CFR-2011-title33-vol3-part329.pdf
- Section 404 of the Clean Water Act requires approval prior to discharging dredged or fill material into the waters of the United States.

http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/materials/cwa_sec404doc.pdf

- Waters of the United States (33 CFR Part 328) include essentially all surface waters, including all navigable waters and their tributaries, all interstate waters and their tributaries, all impoundments of these waters, all wetlands adjacent to these waters, and certain isolated wetlands.
  The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include tundra, permafrost areas, swamps, marshes, bogs, and similar areas.
  Typical activities requiring Section 404 permits include:

  - Discharging fill or dredged material in waters of the U.S., including wetlands.
  - Site development fill for residential, commercial, or recreational developments.
  - Construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs.
  - Placement of riprap and road fills.

  Discharges of fill may include grading or other earthwork into streams or wetlands, construction of temporary access ramps, equipment pads, or temporary containment berms.
  Certain activities are exempt (33 CFR 323.4) from Section 404 permit requirements.
  Section 103 of the Marine Protection Research and Sanctuaries Act requires approval for the transportation of dredged material for the purpose of dumping it in ocean waters at disposal sites previously approved by the U.S. Environmental Protection Agency.

http://www.gpo.gov/fdsys/pkg/CFR-2011-title33-vol3/pdf/CFR-2011-title33-vol3-part328.pdf

National Ocean and Atmospheric Administration

1. Regulate take of threatened and endangered species (CFR Title 50, Chapter II, Subchapter C, Part 222 – General Endangered and Threatened Marine Species) http://www.ecfr.gov/cgi-bin/text-idx?SID=2916760137f149277cfb5acc440b6ac0&mc=true&node=pt50.10.222&rgn=div5
2. Regulate take of marine mammals. (CFR Title 50, Chapter II, Subchapter C, Part 216 – Marine Mammals)
   http://www.ecfr.gov/cgi-bin/text-idx?SID=941fa8e1d0d4fe99b0e41f5efc46ce2b&mc=true&node=pt50.10.216&rgn=div5

U.S. Fish and Wildlife Service

1. Regulate take of threatened and endangered species (CFR Title 50, Chapter I, Subpart B, Part 17 – Endangered and Threatened Wildlife and Plants)

   http://www.ecfr.gov/cgi-bin/text-idx?SID=247d2168f4009d5bf34483957bba9896&mc=true&tpl=/ecfrbrowse/Title50/50cfr17_main_02.tpl

2. Regulate the take of migratory birds (CFR Title 50, Chapter I, Subpart B, Part 21 – Migratory Bird Permits)

   http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=247d2168f4009d5bf34483957bba9896&mc=true&n=pt50.9.21&r=PART&ty=HTML

Appendix M. He‘eia NERR Strategic Plan, Strategies and Outcomes

GOAL 1: Increase our understanding of the effects of human activities and natural events to improve informed decision making affecting the He‘eia estuary, coastal ecosystems, and ultimately the entire ahupua‘a of He‘eia.		
OBJECTIVE	**STRATEGY**	**OUTCOME**
1) Baseline environmental data informs researchers' understanding of the magnitude of changes in the various He‘eia ecosystems.	(a) Document cultural and archaeological information to establish historical and baseline conditions in the ahupua‘a of He‘eia, including the waters of Kāne‘ohe Bay	Ethnographic interviews with kūpuna document what they considered an optimal and healthy state of Kāne‘ohe Bay and the ahupua‘a of He‘eia. The ethnographic and historical data for the He‘eia area inform research.
	(b) Explore the development of a reserve-specific repository to house historical, cultural, and scientific information conducted in He‘eia.	He‘eia historical, cultural, and scientific data and information are compiled and available digitally for internal and external users.
	(c) He‘eia NERR staff will identify the gap areas that need additional research.	Researchers at the He‘eia NERR shall be informed of other research being conducted in the area and possible synergies and data gaps.
	(d) He‘eia NERR staff and partners develop a site profile for the He‘eia NERR by collecting relevant information.	By 2019, a completed site profile is provided to NOAA OCM and interested researchers. He‘eia NERR shall have a complete and approved site profile.
	(e) Support research studies on how floodwaters, sediment, and nutrients move through the ahupua‘a of He‘eia.	Researchers and coastal managers have an improved understanding of how water, sediment, and nutrients movement studies in the through the ahupua‘a of He‘eia are conducted.
	(f) Create opportunities to conduct research within the ahupua‘a, potentially outside the He‘eia NERR boundaries, that provides relevant information about impacts on the entire ahupua‘a of He‘eia, to inform the long-term vision of a healthy He‘eia ahupua‘a.	The long-term vision of the He‘eia ahupua‘a is informed by research conducted within the ahupua‘a.
	(g) Conduct scientific research and monitoring that will provide information on climate change, water quality, estuary habitat change, and other topics of local and national interest and significance.	Information on topics of local and national interest and significance shall be developed from research and monitoring conducted in the He‘eia NERR.
	(h) Establish 4 water quality SWMP stations and 1 weather station	He‘eia NERR SWMP data contributes to local understanding of changes in the He‘eia ecosystem. By 2018, He‘eia NERR SWMP program is integrated with the national monitoring program (i.e. NERRS, NOAA Sentinel Sites and IOOS).
	(i) Implement baseline biodiversity surveys with He‘eia NERR site partners	Comprehensive biological survey data informs reserve site profile and is available to use by researchers.
	(j) Establish a site experimental design that supports ecosystem-based management research approach.	Treatment and control areas are identified within each major ecosystem type for the He‘eia NERR.
	(k) Recruit and maintain reserve research and monitoring staff.	Staff are supporting the development and implementation of He‘eia NERR research programs.

GOAL 1: Increase our understanding of the effects of human activities and natural events to improve informed decision making affecting the He‘eia estuary, coastal ecosystems, and ultimately the entire ahupua‘a of He‘eia.		
OBJECTIVE	**STRATEGY**	**OUTCOME**
2) Coordinate independent research and monitoring efforts in the ahupua‘a.	(a) Develop a comprehensive long-term environmental monitoring program for He‘eia NERR in upland, estuarine, and marine ecosystems.	Researchers and partners improve their understanding of short and long-term changes within the He‘eia ahupua‘a.
	(b) He‘eia NERR staff coordinates implementation of the He‘eia NERR monitoring program with site partners.	The He‘eia NERR monitoring programs are linked to local monitoring efforts.
	(c) Facilitate the coordination, collaboration, and distribution of all scientific investigations conducted within the ahupua‘a of He‘eia (to the extent legally permissible) to minimize duplication of research and identify the gap areas that need additional research.	Researchers at the He‘eia NERR shall be informed of other research being conducted in the area and possible synergies and data gaps.
	(d) Recruit and maintain He‘eia NERR research and monitoring staff.	Staff support He‘eia NERR implementation of SWMP and other key terrestrial and marine monitoring efforts.
	(e) Collaborate with new partners conducting relevant research and monitoring efforts	New external partnerships are established.
Integrate traditional knowledge and research in the He‘eia NERR that will better reflect and inform community decision making toward creating a sustainable ecosystem.	(a) Create opportunities for Native Hawaiian practitioners, scientists, (including those with expertise in traditional and customary practices) and others (including those with expertise in contemporary science) to collaborate and develop contemporary mo‘olelo (stories) reflecting change that reflect and track changes in the He‘eia ahupua‘a over time.	Contemporary mo‘olelo for He‘eia ahupua‘a inform the collective understanding of recent changes within the ahupua'a.
	(b) Coordinate periodic community meetings to inform the community about upcoming scientific research opportunities, gather input to guide further research, and share ongoing research results.	At least 2 local communities are knowledgeable of the ongoing and planned research within the He‘eia NERR.
	(c) Work with site partners to share ecosystem-based best management practices that support improved management of the He’eia ahupua’a.	Ecosystem-based best management practices are applied by communities to improve coastal ecosystems.
	(d) Creates opportunities for the “synthesizers” or “bridgers” of traditional customary practices and contemporary science to collaborate and share their findings and recommendations.	Site partners and the community are knowledgeable of the synthesizers’ mana‘o about the nexus of traditional practices and contemporary science.

	***Synthesizers/bridgers are defined as individuals who applies different ways of knowing including traditional practices and contemporary science.*	
	STRATEGY	**OUTCOME**
	(e) Recruit and maintain reserve educational and cultural staff.	Staff are supporting the integration of traditional knowledge and scientific research in the He’eia NERR.

GOAL 2: Develop a place-based education and training program for the He‘eia NERR that inspires and educates the community about estuaries, coastal ecosystems, and traditional Hawaiian practices, such as lo‘i and loko i‘a, that mālama (nurture) these systems sustainably.		
OBJECTIVE	**STRATEGY**	**OUTCOME**
4) Increase student, educator, and community understanding of estuaries in general and in particular Hawaiian estuaries, coastal habitats, and the ahupua‘a land management system.	(a) NERR educational programs build on existing efforts and cultural resources (e.g. the poster by Marilyn Kahalewai of a traditional ahupua‘a) and incorporate a traditional cultural perspective.	At least 50% of students and teachers participating in NERR educational programs demonstrate improved understanding of traditional Hawaiian culture.
	(b) Kūpuna make traditional Hawaiian cultural information available to the He‘eia NERR and local communities.	Local communities and the NERRS network have improved access to educational and cultural resources based on the He‘eia ahupua‘a.
	(c) He‘eia NERR will include kūpuna in He‘eia site tours as part of a cultural orientation to the He‘eia NERR site.	At least 50% of NERR visitors experience a cultural orientation to the He‘eia NERR.
	(d) Kūpuna testimonials are included as part of a cultural orientation to the He‘eia NERR site.	At least 50% of NERR visitors experience a cultural orientation to the He‘eia NERR.
	(e) He‘eia NERR staff develop programs that incorporate information about the entire ahupua‘a of He‘eia.	At least 50% of students and others participating in NERR programs have an improved understanding of the He’eia ahupua‘a.
	(f) Provide site-specific educational experiences that facilitate hands-on exploration of the upland, estuarine, and marine environments in the He‘eia estuary with site partners.	Annually, at least 2 education and training events at the He‘eia NERR include hands- on activities coordinated with site partners.
	(g) Translate reserve estuarine science and monitoring data to develop data visualizations for use in educational and training programs.	Increased understanding of estuarine science, monitoring data and the He’eia estuary.
	(h) Reserve staff will develop and establish the system- wide K-12 Estuarine Education Program (KEEP) at the He‘eia NERR.	He‘eia NERR has a NOAA approved KEEP program in place.

	STRATEGY	OUTCOME
	(i) Recruit and maintain He‘eia NERR educational, stewardship and cultural resource staff.	Staff are supporting He‘eia NERR educational, training and interpretation programs.
	(j) Establish and maintain He‘eia NERR website.	Increased understanding of estuarine science, monitoring data and the He’eia estuary.

GOAL 2: Develop a place-based education and training program for the He‘eia NERR that inspires and educates the community about estuaries, coastal ecosystems, and traditional Hawaiian practices, such as lo‘i and loko i‘a, that mālama (nurture) these systems sustainably.		
OBJECTIVE	**STRATEGY**	**OUTCOME**
5) Provide a comprehensive framework to integrate and enhance coordination and effectiveness of place-based education and training programs that have been initiated independently by the He‘eia community.	(a) Collaborate with the Hawai‘i Department of Education (DOE) to explore ways to integrate state K-12 educational standards into He‘eia NERR education program curricula.	A pilot NERR education program addresses state educational standards and is aligned with the K-12 curriculum for one elementary and one secondary grade band.
	(b) 1. Develop cultural standards and operating protocols for reserve education, training, and interpretation programs at the He‘eia estuary with the assistance of stakeholders such as the KHCC and other native Hawaiian cultural practitioners in the He‘eia community. (b) 2. The Stewardship and Cultural Resources Coordinator shall implement a cultural workshop with partners to coordinate discussions on cultural standards and protocols.	Place-based education programs at the He‘eia NERR incorporate and follow cultural protocols.
	(c) Develop initiatives that allow the He‘eia NERR and site partners to coordinate and integrate aspects of their educational activities.	At least 2 site partners have integrated an educational program or aspects of their educational programs at the He‘eia NERR.

GOAL 3: The Heeia NERR will engage various communities to create opportunities for collaboration to practice and promote stewardship that sustains cultural, biological, and natural resources.		
OBJECTIVE	**STRATEGY**	**OUTCOME**
6) Integrate traditional knowledge and contemporary science to effectively address climate change, habitat restoration, and water quality.	(a) Utilize historical photos, testimonials, and other information to document the land use history of the ahupua‘a of He‘eia and incorporate into He‘eia NERR education and interpretative programs.	Visitors to the He‘eia NERR indicate increased awareness of the interconnectedness of activities in the mauka and makai areas, including the history of cultural activities in the area and the effect changing uses has had on the ecosystem.
	(b) Consult with the Ko‘olaupoko Moku Kūpuna Council to develop methods for kūpuna to inform	Place-based cultural and scientific education programs at the He‘eia NERR incorporate input from kūpuna.

	cultural and scientific education programs at the He‘eia NERR.	
	STRATEGY	**OUTCOME**
	(c) Develop and establish the Coastal Training Program to support training opportunities for targeted coastal decision maker audiences.	The He‘eia NERR has a fully developed and NOAA approved Coastal Training Program.
	(d) Provide technical assistance to site partners in support of ongoing traditional agricultural (taro lo'i) and aquaculture (He‘eia fishpond) practices	Measured improvements of targeted ecosystem services provided by traditional land use practices
	(e) Collect and analyze ecosystem service data for each management approach implemented at the He‘eia NERR.	Ecosystem service data inform strategies for adaptive management at He‘eia estuary and other estuaries.
7) Engage and educate the community on the practices and values of the ahupua‘a land management system; in other words, promote ‘āina momona and enhanced stewardship efforts by all sectors of the community, to increase their understanding of how human activities and natural events affect the estuary.	(a) Provide a variety of hands-on stewardship experiences to the community groups and visitors.	The community groups and visitors of the He’eia NERR improve their understanding of ‘āina momona.
	(b) Collaborate with partners to incorporate He‘eia NERR science, traditional knowledge and information in the rehabilitation of historical, agricultural and aquacultural resources within the He‘eia NERR.	The He‘eia NERR agricultural and aquacultural resources are managed sustainably to provide food security and other ecosystem services for local communities.
8) Become a leading repository of information for cultural, biological, and natural resources in the He‘eia estuary.	(a) Organize and incorporate cultural and natural resource information from the broader community into the He‘eia NERR website and other accessible platforms.	Increased awareness of He‘eia estuary resources and information.

GOAL 3: The He‘eia NERR will engage various communities to create opportunities for collaboration to practice and promote stewardship that sustains cultural, biological, and natural resources.		
OBJECTIVE	**STRATEGY**	**OUTCOME**
9) Develop the tools, capacity and connections to increase public awareness across the	(a) Engage with site partners and other organizations such as local civic clubs to implement public outreach activities in the He’eia ahupua‘a.	Communities and individuals gain an understanding of the ecological and cultural significance of the He‘eia estuary.

	STRATEGY	OUTCOME
community, island, state, nation, and the world of the ecological and cultural significance of the He‘eia estuary and ultimately the entire ahupua‘a of He‘eia.	(b) He‘eia NERR staff utilize the expertise of cultural experts, such as the KHCC members, as haku (ambassadors) for the He‘eia NERR.	Expertise of haku (ambassadors) are integrated into He‘eia NERR outreach activities.
	(c) Implement an assessment of He‘eia NERR facility needs.	He’eia NERR has a plan that allows sufficient infrastructure and facilities to support research, education and stewardship programmatic activities.
	(d) Recruit and hire a Reserve Manager to coordinate and supervise NERR operations and management.	The He’eia NERR management plan is implemented and core partnerships are established.
	(e) The Reserve Manager will form and engage a Reserve Advisory Board (RAB) to gather advisory guidance on He‘eia NERR activities and planning.	Within the first year, the RAB is established and sets its meeting and committee structures.
	(f) Establish and maintain He‘eia NERR website.	Increased understanding of ecological and cultural significance of the He‘eia estuary.
	(g) Engage in the NERR national system and at relevant state, regional, national, and international scales.	Communities and individuals gain an understanding of the ecological and cultural significance of the He‘eia estuary.
	(h) Plan for future He‘eia NERR facilities that integrate climate adaptation strategies and incorporate traditional Hawaiian values and customs.	He‘eia NERR facilities are resilient to a changing climate and embody the unique relationship between the Hawaiian people and the land.
10) Support restoration of key areas in the He‘eia NERR to improve habitat and increase ecosystem services.	(a) Demonstrate restoration best practices in the land and estuarine stewardship of He‘eia NERR natural resources that support climate change adaptation.	He‘eia NERR natural resource are more resilient to a changing climate.
	(b) Revise land acquisition and habitat restoration projects, taking into account climate change impacts.	By 2018, land acquisition and habitat restoration plans are revised to incorporate climate vulnerabilities.
	(c) He‘eia NERR uses a multi-disciplinary and multi-sector approach in the implementation of restoration initiatives.	He‘eia NERR is viewed as an example of multi-disciplinary and traditional approaches to ecosystem-based management.
	(d) Work with partners to develop and implement a hybrid ecosystem framework for upland reforestation.	Measured improvements of targeted ecosystem services provided by upland habitat.
	(e) Provide technical and monitoring assistance to support the removal of mangrove habitat and replacement with native estuarine species.	Measured improvements of targeted ecosystem services provided by estuarine habitat.
	(f) Develop a restoration and monitoring plan in collaboration with partners to guide the restoration of the He‘eia Stream and adjacent buffer.	Restoration and monitoring plan guides future stream restoration and monitoring.

STRATEGY	OUTCOME
(g) Provide technical assistance and support for the removal of invasive species and the establishment native plant communities within the He‘eia Stream buffer and stream channels.	Measured improvements of targeted ecosystem services provided by the He‘eia Stream and riparian habitats.
(h) Collaborate with partners on existing coral reef restoration and monitoring initiatives that are occurring within the marine boundaries of the reserve.	Measured improvements of targeted ecosystem services provided by marine habitat.
(i) Coordinate future restoration planning and monitoring activities within marine boundaries of the reserve.	Partners actively coordinate their marine restoration with He‘eia NERR staff.