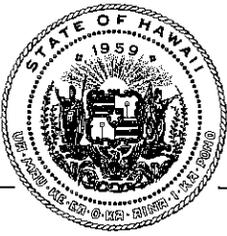


# Hawai'i Ocean Resources Management Plan Public Review Draft Fall 2012



**Hawaii CZM Program**  
Coastal Zone Management  
HAWAII STATE OFFICE OF PLANNING





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Aloha,

Thank you for your interest in Hawaii's Ocean Resources Management Plan (ORMP). The collective vision guiding the ORMP is connecting land and sea; preserving our ocean heritage; and promoting collaboration and stewardship.

The ORMP is required pursuant to Hawaii Revised Statutes Chapter 205A. The following document is the five-year update of the ORMP. However, the ORMP update is much more than a legal requirement. The update is the culmination of feedback from several meetings, where coastal and marine resource management priorities for the next five years were discussed among county, state, and federal agencies; non-governmental organizations (NGO); and several communities across the state. It is a living document that articulates and addresses the needs and concerns of Hawaii's people, as it relates to coastal and marine resource management.

The ORMP is intended to address activities, projects, and programs that will help the State of Hawaii be effective managers and stewards of coastal and marine resources. The plan is not intended to identify every possible coastal and marine management concern or foreclose management options. It also recognizes that priorities may change in an uncertain world. However, the principles and framework for addressing management priorities and the partnerships established during the update process are intended to support ongoing coastal and marine resource management challenges confronting the state.

Continued support by several and various stakeholders is crucial to the plan's success. Implementation of the plan is dependent upon the continued personnel support of the participants who contributed to the plan, and funding support by county councils, the legislature, federal entities, and NGOs. The time and energy spent by ORMP update participants will go a long way in moving priorities forward.

Thank you to everyone who participated in this process, especially Governor Abercrombie, who is a staunch supporter of coastal and ocean resource management.

We look forward to continuing our partnerships to implement the ORMP.

Mahalo,

Jesse K. Souki, Director

## I. Introduction

When people talk about water, they are talking about a life source. With water, there is life. This includes the water coming down as rainfall at the top of the mountains, the waterfalls, the streams and rivers, and the ocean that surrounds Hawai‘i. This *Ocean Resources Management Plan* (ORMP) discusses management of the ocean and coastal resources, including the water that feeds the ocean surrounding the islands.

The ORMP examines the pressures on Hawaii’s fragile ocean and coastal ecosystems, discusses conflicts on uses of ocean resources and ways to resolve them, incorporates sustainability into this planning document to preserve the ocean and coastal resources for future generations, and aligns the ORMP with other statewide planning efforts as well as the National Ocean Policy.

The ORMP acknowledges that just as economic growth is vital to Hawai‘i, so too must its impacts be properly managed to preserve our natural resources and reduce conflicts among resource users. Protecting ocean resources requires taking a look at new directions and new integrated management approaches. The ocean’s carrying capacity is unclear, yet exceedingly important. Reliance on outside sources for food, energy, and economic activity erode the once sustainable lifestyle on the islands.

At public listening sessions, participants frequently say, “Hawai‘i is not what is used to be.” There are concerns that if certain trends continue, treasured parts of Hawai‘i will be lost, irretrievably. Consequently, land and water conflicts and disputes have become more fierce, eroding the Aloha Spirit, the social fabric of the community.

The *New Day in Hawaii Plan* prepared by Governor Neil Abercrombie in 2010 states that Hawai‘i must change direction if it is to move forward. In particular, we must move away from postponing problem solving, and we must move away from divisive, negative politics that tear us apart. The *New Day Plan* quotes the Rev. Abraham Akaka: “Put our paddles in the water and pull deeper from the rough seas of the present, safely to the shore of the future.”

The *2050 Hawai‘i Sustainability Plan* sets the tone for the ORMP work by presenting a three-pronged definition of sustainability:

- Respect the culture, character, beauty, and history of our State’s island communities;
- Strike a balance among economic, social and community, and environmental priorities; and
- Meet the needs of the present without compromising the ability of future generations to meet their own needs.

The establishment of a National Ocean Policy (NOP) issued on July 19, 2010 by Executive Order, presents a significant change since the *2006 ORMP*. Aligning the Hawai‘i ORMP with the NOP is one of the objectives for this update.

The purpose of this *Ocean Resources Management Plan*, and of other related state plans, is to identify a vision and the actions necessary to create that vision. It seeks to achieve all three prongs of the sustainability definition: to respect the culture and character and beauty of the island, to balance economic, social, and environmental priorities, and to meet present needs without compromising future generations. While a plan document alone cannot stop or reverse negative activities, nor can it impel

positive action. A plan process is a place to articulate preferred outcomes, to identify what can be done and by whom, and to provide a basis for individual and group accountability.

The *Ocean Resources Management Plan* is meant to address activities by agencies and entities in the State of Hawai‘i. As a state plan, the first audience is state agencies with responsibilities for the land, coast, and ocean. But since jurisdiction for these activities also includes federal and local entities, they are considered partners in state activities. Furthermore, as citizen stewards of the land and the ocean, every person present in Hawai‘i, resident and visitor alike, plays an important role in the protection and preservation of these life-sustaining resources. Education and awareness are our most powerful tools at both the agency and the citizen level.

This plan seeks to advance the area of measurement in the plan’s goals, management priorities, and actions. By setting benchmark measures, by monitoring progress, and by addressing the results, we create a continuous feed-back loop to inform decision making and to help adjust priorities and resources. Ultimately, the judgment of our success in ocean resource management will be made by future generations. They will see the results of our efforts and live in the world we create.

## Background of this Plan

The State of Hawai‘i has been formally addressing ocean management for nearly three decades. The first *Ocean Management Plan for Hawaii* was completed in April 1985, prepared under a grant from the National Oceanic Atmospheric Administration’s (NOAA) Office of Ocean and Coastal Resource Management. That plan set forth policies to guide the direction and coordination of state agencies responsible for the conservation of marine resources. Topics of concern at the time included nearshore recreation, marine conservation and preservation, ocean waste disposal and accidental spills, beach erosion, fisheries, harbor development, coastal energy facilities, mariculture, ocean thermal energy conversion, and manganese nodules. Most of these sector topics remain important today.

In the period from 1989-1991, Hawai‘i embarked on its first statewide planning effort ever, which became known as the *Hawaii State Plan*. It was adopted in June 1989 and codified as HRS Chapter 226. Part I of the State Plan listed overall themes and goals; Part II established a statewide planning system to coordinate implementation; and Part III established priority guidelines in five major areas: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education. Under Part II came the twelve State Functional Plans. While ocean resource management was not one of the twelve, elements concerning ocean protection and conservation can be found in the Functional Plans for Agriculture, Conservation Land, Recreation, and Tourism, which were all adopted in 1991.

At the same time as Functional Plans were being prepared, the State prepared the *1991 Hawaii Ocean Resources Management Plan* under HRS Chapter 228. Review was made of published materials and expertise from government, industry, and research to review sector based management issues in: ocean research and education, ocean recreation, harbors, fisheries, marine ecosystem protection, beaches and coastal erosion, waste management, aquaculture, energy, and marine minerals. The *1991 ORMP* called for a central authority for planning and policy making, inter-agency coordination, communications facilitation, and conflict resolution. The central office was never established; instead, the function has been carried out by the Office of Planning and the Coastal Zone Management (CZM) Program. After much debate on governance and the role of an advisory group, the *1991 ORMP* was adopted by the State Legislature in 1994. The following year, the State Legislature named the Office of State Planning as the lead agency for implementing the plan and established the Marine and Coastal Zone Management Advisory Group (MACZMAG) to be made up of state and county agencies and non-governmental

members. MACZMAG would serve as a forum to facilitate implementation and to discuss coastal zone and ocean issues.

A review of the *1991 ORMP* was conducted in 1998. The review examined the sector-specific activities and recommended actions for improvement. The review also identified management issues that seemed to hamper implementation: lack of strategic planning; inadequate enforcement; lack of recognition of the ecological and economic importance of ocean and coastal issues; inadequate access to information; outdated management regimes for ocean and coastal management; inadequate management capabilities; lack of administrative efficiency; and inadequate administrative flexibility for resource managers. The most common criticism of the *1991 ORMP* was that it no longer reflected current political and economic realities. Declining government resources, changes in government priorities and programs, and declining support for resource management had undermined specific actions in the plan. Because the context for management had changed so dramatically, some argued, what was needed was a more strategic approach to ocean resource management, with a focus on a few key issues and priorities.

The *2006 Ocean Resources Management Plan* charted a new course of action. The pinnacle of this new approach was the Three Guiding Perspectives.

#### **2006 ORMP New Course of Action**

##### **Perspective 1: Connecting Land and Sea**

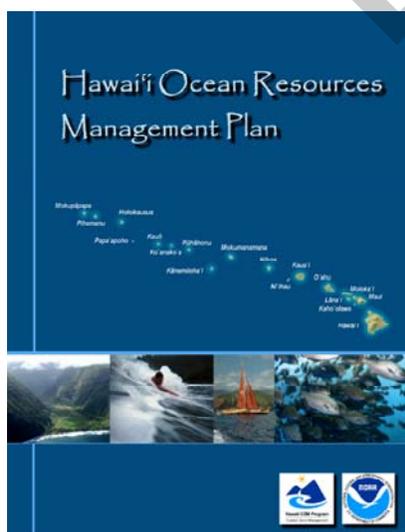
Careful and appropriate use of the land is required to maintain the diverse array of ecological, social, cultural, and economic benefits we derive from the sea.

##### **Perspective 2: Preserving our Ocean Heritage**

A vibrant and healthy ocean environment is the foundation for the quality of life valued in Hawaii and the well-being of its people, now and for generations to come.

##### **Perspective 3: Promoting Collaboration and Stewardship**

Working together and sharing knowledge, experience, and resources will improve and sustain our efforts to care for the land and the sea.



The foundation for an integrated approach to natural resource management looked to communities to help assess the health and vulnerability of their surrounding environment and to formulate best management practices for sustainable, long-term land and natural resource management alternatives. The integrated concepts bore similarities to the traditional Hawaiian practice of *ahupua'a* management, which is generally resource management of a subdivision of land from the mountain to the sea.

The *2006 ORMP* laid out a phased implementation approach, describing expected outcomes for each of the five-year phases defined through the year 2030. Because change takes time, four phases of implementation were recognized. The first phase, termed Demonstration, would demonstrate how the guiding perspectives could be adopted in select communities in the State. The second phase, termed Adaptation, is when the perspectives would start being

applied more broadly. The third phase, termed Institutionalization, would more firmly implant the perspectives in agency work plans. The final phase, termed Mainstreaming, would practice the perspectives as standard, without the need to consider them for priority attention. Each phase would build upon lessons learned from the previous phase as well as identify and address new threats and forces.

## What has Changed in the 2013 Ocean Resources Management Plan and How it was Prepared

This *Public Review Draft 2013 Ocean Resources Management Plan* is considered an update of the *2006 ORMP*. It continues the new direction and course of action.

The 2013 ORMP uses new terms which more closely mirror the way terms are used in other state plans such as the *2050 Sustainability Plan* and the *New Day Plan*. New graphics have been added and editing has been done to make the plan more reader- and user-friendly.

The ORMP Three Perspectives remain intact as a way to integrate ocean resource management and to provide guidance for all of the actions that the ORMP agencies and partners do to manage Hawaii's ocean resources. The ORMP Three Perspectives are neither priorities nor goals, but merely an overall statement of the ORMP vision. Chapter II discusses the Three Perspectives, defining goals and strategies below each perspective as a way to achieve them.

New issues and drivers are identified, explained, and incorporated in Chapter III. The focus on integration and agency coordination, as well as community participation, remains central and is discussed in Chapter IV. Chapter V outlines what was completed during the Demonstration Phase since the *2006 ORMP*.

Chapter VI discusses the upcoming Adaptation Phase of the ORMP. The Adaptation Phase will implement and track actions to accomplish ten Management Priorities. This chapter simplifies the presentation of the Actions (formerly Strategic Actions) by implementing agencies. Among these Actions is how the state agencies will address the National Objectives articulated in the National Ocean Policy, which was decreed by Executive Order in 2010. The *Public Review Draft 2013 ORMP* also adds ways to measure progress, including benchmarks ("Where we are now"), targets ("Where we want to be"), and quantifiable indicators or metrics for monitoring and reporting progress.

Work towards preparation of an updated ORMP began in 2011, when the Office of Planning (OP) received a grant from NOAA to begin the update process. After contracting with a consultant to assist, work began in earnest during 2012 with a series of in-depth interviews with state and county agency participants in the ORMP Policy Group and the ORMP Working Group. Previous documents and related plans prepared by the participating agencies were reviewed to identify coordination and integration issues.

### ORMP Terminology

**Three Perspectives** = Broad Outcomes

**Strategies** (formerly Management Goals) = Approaches to be used

**Management Priorities** = Ten areas of focus which involve one or more state agencies, sometimes working with county, federal, non-governmental organizations, or private multiple parties, and those comprising actions which will be closely tracked and monitored during the Adaptation Period.

**Goals** = Each of the ten Management Priorities has at least one goal, and some have two goals. These goals are linked to metrics.

**Actions** (formerly Strategic Actions) = projects and activities to achieve the Management Priorities

**Metrics** = Indicator or measures of performance and progress; typically indicators are for the actions

A series of eight statewide Public Listening Sessions (PLS) were held, and these were attended by over three hundred individuals who reported about issues and problems on their island. Summaries of both the interviews and the PLS were prepared and discussed with the Working Group as part of working meetings to determine the appropriate areas of emphasis and priority for the ORMP update.

This *Public Review Draft 2013 ORMP* is meant to be widely circulated and become the basis for a second round of statewide Public Listening Sessions to be held in October and November 2012. Interested parties can also participate in the update process by providing comments on the CZM website at: <http://hawaii.gov/dbedt/czm/ormp/ormp.php>

## What Was Accomplished Since the 2006 ORMP?

The commitment to protecting Hawaii's ocean climate and to address activities that compromise it remains strong. The ORMP continues to serve as the coordinating mechanism for state and county agencies and those who work with the state on matters of conservation, mitigation, enforcement, and preservation. The organizational framework for implementing the ORMP was formed in 2007, with the creation of the Policy Group and the Working Group who both continue the work of collaboration.

Each group has been strengthened in the past six years through consistently meeting (nine times for the Policy Group and 50 times for the Working Group between 2007-2012). At these meetings they could address problems of mutual concern and interest across jurisdictional boundaries, even as state resources, funding, and staffing were severely challenged. ORMP partners bring a varied set of key skills and expertise as well as relationships with community constituencies, such as stakeholder engagement, planning, and facilitation, and trusted relationships with community groups for on-the-ground implementation. According to a survey of members, the Working Group: improves inter-agency working relationships, participants are able to identify common challenges, and this assists with streamlining. A new state administration in 2010 chose to continue the important work of the Policy Group and the Working Group. The transition and change-over of members occurred smoothly and work has benefitted from renewed energy.

Two examples demonstrate collaborative undertakings. There was a collaborative effort on watershed management in which the ORMP Working Group formed a watershed caucus and later worked with the CZM Program's Coastal Nonpoint Pollution Control Program (CNPCP) to help organize a Watershed Summit in 2009. The information gained through the caucus and the Watershed Summit helped to inform the 2009 *Hawaii Watershed Prioritization Process* and the 2010 *Hawaii Watershed Guidance*.

The second was a collaborative effort on climate change. Efforts started in 2009 with the development of *A Framework for Climate Adaptation in Hawai'i*, in association with the University of Hawai'i Center for Island Climate Change Adaptation and Policy (ICAP). A year later, members of the ORMP Policy Group and Working Group not only participated in a two-day workshop on climate change, but also helped prepare draft climate change legislation, which was submitted by OP, passed by the 2012 State Legislature, and signed into law by Governor Neil Abercrombie on July 9, 2012. Climate change adaptation efforts are receiving high priority, and this should continue during the next phase of ORMP implementation.

The ORMP Working Group and Policy Group formulated a two-year *Consolidated Work Plan* in 2008 to set a baseline for their strategic actions. There were 113 activities listed under the ten management goals. In 2010 they participated in a two day strategic planning session which resulted in a written mission statement. Progress on the Strategic Actions listed in the 2006 ORMP were monitored in 2009 (Interim) and in 2012 as part of the update evaluation that led to the first draft of the 2013 ORMP. The interim

review found that about 60 percent of the actions were being worked on at some stage by a combination of state, federal and/or county agencies.

The 2012 review found that while some of the activities were accomplished, many other activities were under the purview of agencies that were not involved in the Working Group or Policy Group, such as the Department of Education. Members of the community gave feedback during the Public Listening Sessions that they needed to see themselves in the ORMP, as they had much to contribute to managing ocean and coastal resources. The 2012 review also found that there needed to be one lead agency associated with each action, or there would not be any leadership or accountability with ways to measure performance. Finally, the review also found that there were too many strategic actions and activities, and that the perspectives, management goals, strategic actions, and activities needed to be simplified. This ORMP update takes all of this feedback into consideration and attempts to simplify the goals, objectives, and strategic actions for all involved.

Several place-based efforts were undertaken during the ORMP Demonstration Phase, and most were ecosystem focused. Many were given financial support from OP-CZM and/or other state agencies. These included:

- Māhuhua ‘Ai O Hoi (He‘eia Wetlands, O‘ahu)
- Maunalua Bay Education and Outreach on Land-Based Pollution (O‘ahu)
- Kawainui Marsh Levee Certification (O‘ahu)
- West Maui Watershed (Maui) – development of a watershed management plan out to outer reef
- Honu‘apo Estuary restoration of wetland and riparian areas/ Best Management Practices (BMP) (Hawai‘i Island)
- Hilo Bay Watershed Advisory Group Website and Water Quality Monitoring Program (Hawai‘i Island)
- Pacific Tsunami Museum risk assessment from storm surge and coastal flooding (Hawai‘i Island)
- Pu‘u O Umi Natural Area Research and Kohala Forest Reserve Watersheds- Baseline monitoring at High- yield watersheds Units C & D (Hawai‘i Island)
- Reducing Risk: Army Corps of Engineers Silver Jackets Initiative (statewide)
- MACZAC outreach (statewide)

An example of a highly successful project is the He‘eia Wetlands project, which has since been chosen as a NOAA Sentinel Site. What this means is that it started as a single undertaking, the cleaning of the marsh. From that, additional tasks were undertaken and funding sought for a fishpond restoration. NOAA chose this site based on its unique blend of characteristics: a dynamic physical setting, an ecologically diverse environment, and a rich culture of historical significance. The 405-acre property of the He‘eia Wetlands is referred to as *Hoi*, and is a marshland area formed within the *ahupua‘a* of He‘eia on the island of O‘ahu. The waters from Ha‘ikū and Ioleka‘a Valleys form the wetlands where taro was traditionally grown. In the mid 1800’s, the wetland taro fields were replaced by sugarcane, pineapple, and rice, and later, cattle. These new land uses intensified erosion and runoff, degrading the adjacent He‘eia Fishpond. Mangroves were planted to

Figure 1-1: Project Māhuhua ‘Ai o Hoi



control erosion, but as they moved downstream, they closed the mouth of He‘eia Stream.

A community-based non-profit organization, Kāko‘o ‘Ōiwi, entered into a 38-year lease agreement with the Hawai‘i Community Development Authority (HCDA) to implement Māhuhua ‘Ai O Hoi and restore the ecosystem while providing cultural, environmental, and educational programs throughout the watershed.

Undertaking projects in a place-based manner incorporates many of the management principles of traditional Hawaiian *ahupua‘a* system, as well as current state of the art community planning practices. Lessons learned from place-based practices during the Demonstration phase are meant to be shared and used during the next implementation period, the Adaptation Phase.

### ***Definitions and Key Terms***

*Kanaka Maoli*—indigenous people of the Hawaiian Islands or their descendants, which may be pure or part Native Hawaiian

*ahupua‘a*—in Hawai‘i, a common subdivision of the land. Normally, it extends like a slice of the island from the mountains to the ocean so that resources from upland and the sea are available to the inhabitants, and it would usually divide along stream systems.

DRAFT

## II. Vision and Perspectives for Ocean Resource Protection and Management

### Vision

The vision for Hawaii's ocean resources is islands surrounded by pristine waters, where a diversity of native species can live and thrive. The ocean is able to supply residents with an abundance of fish and plant materials which sustain cultural practices and living needs. The ocean continues to be where residents and visitors find a place for recreation, relaxation, and spiritual renewal.

The vision for the ocean surrounding the Hawaiian Islands includes activities on the coast where the ocean meets land. Together, the ocean and coastal areas are able to be a source of economic sustenance, including supplying energy, the location of harbors for commercial cargo, as well as fishing, gathering, and boating.

In this vision, cooperation and collaboration with agencies at all levels: county, state, and federal, enhances the quality of life for all who live, work, and visit Hawai'i. In this vision, government agencies interact with the community and non-profit organizations to further the ORMP Three Perspectives.

In this vision, Hawaii's public and private interests understand the interconnections between land practices and the ocean and practice sustainable living. Agriculture, development, military, and visitor industry activities interact with each other and resolve conflicts in a manner which is *pono* or fair to all parties, which is central to our management of this life-supporting resource. Each person carries a *kuleana* or responsibility for using sustainable practices on the land and the ocean, and for supporting the health and well being of the ocean by all users.

### Perspectives and Strategies

To fulfill this vision, this *Ocean Resources Management Plan* carries forward three Perspectives, which were first articulated in the *2006 ORMP* as a way to integrate ocean resource management, and each Perspective provides guidance to this end.

#### ***Perspective One: Connect the Land and Sea***

Strategies for Perspective One include:

- 1.1. Improve coastal water quality by reducing land-based sources of pollution from upland forests and urbanized areas, restoring natural habitats, and protecting beaches, shorelines, and coasts.
- 1.2. Protect beaches, wetlands and coastal communities from shoreline erosion and other coastal hazards.
- 1.3. Develop a Hawai'i beach and shoreline management plan to restore and protect wetlands, streams, estuaries, shorelines, and coasts
- 1.4. Improve and ensure maintenance and appropriate use of environmental infrastructure.
- 1.5. Reduce the number of individual wastewater systems and illegal stormwater discharges to the wastewater system while inspecting and maintaining sewer collection systems, especially in the coastal environment.

- 1.6. Through integrated policies and plans, ensure freshwater quantity is maintained in aquifers and streams to assist with restoration of flows to wetlands, streams, estuaries, and near shore waters.

### ***Perspective Two: Preserve Our Ocean Heritage***

Strategies for Perspective Two include:

- 2.1. Improve coastal water quality by reducing marine sources of pollution.
- 2.2. Preserve the economic drivers of agriculture and tourism, while minimizing the introduction of and spread of marine alien and invasive species into and throughout archipelagic waters
- 2.3. Promote sustainable ocean-based tourism.
- 2.4. Improve enforcement capacity of all rules and laws relating to ocean resource protection.
- 2.5. Provide appropriate waste management infrastructure to support commercial and recreational marine facilities.
- 2.6. Improve the health of coastal and ocean resources for sustainable traditional, subsistence, recreational, and commercial uses.
- 2.7. Establish and institutionalize approaches for restoration of ancient Hawaiian coastal fishponds and salt ponds.
- 2.8. Establish, enhance and restore public access to the shoreline and scenic vistas while supporting appropriate coastal dependent uses of the shoreline.
- 2.9. Promote appropriate and responsible ocean recreation and tourism that provide culturally informed and environmentally sustainable uses for residents and visitors.
- 2.10. Encourage appropriate ocean science and technology with safeguards for ocean resource protection.
- 2.11. Promote alternate ocean energy sources and identify how to safeguard the ocean when alternate energy uses the ocean for resource extraction and/or transmission.
- 2.12. Promote sustainable commercial aquaculture in coastal areas and ocean waters to diversify and expand Hawaii's economy and provide local food source; and identify how to safeguard the ocean from aquaculture waste and also determine appropriate locations and safeguards for aquaculture.
- 2.13. Expand ocean science and technology.

### ***Perspective Three: Promote Collaboration and Stewardship Practices***

Strategies for Perspective Three include:

- 3.1. Apply place-based approaches to the management of natural and cultural resources.
- 3.2. Develop integrated natural and cultural resource planning processes and tools.
- 3.3. Build community capacity in natural and cultural resource management.
- 3.4. Participate in the Pacific Regional Ocean Partnership and other initiatives to coordinate with National Ocean Policy objectives.
- 3.5. Develop capacity for coastal and marine spatial planning that is integrated with the statewide GIS.

### III. Pressures On The Ocean and Critical Issues That Need To Be Addressed

#### Introduction

This chapter examines pressures on the ocean and coastal resources as well as issues that need to be addressed. It includes a review of the driving forces that were examined in the *2006 ORMP* as well as emerging issues that affect the ocean and its resources in current day. This chapter references other statewide plans and policies that discuss these emerging issues and gives information on community groups and agencies that are doing work to improve ocean and coastal resources. This chapter was also informed by feedback that OP-CZM received at the Public Listening Sessions, which were held on the islands of Kaua'i, O'ahu, Maui, Moloka'i, Lāna'i, and the East and West sides of Hawai'i Island in spring 2012.

Future economic growth and activities of the population are expected to place great demands on Hawaii's ocean and coastal resources. Increased urbanization, tourism, recreation, and commercial uses utilize the ocean resources in different ways. While economic growth is vital to Hawai'i, its impacts must be properly managed to preserve our natural resources and reduce conflicts among resource users. The current status of ocean management in the State of Hawai'i, as outlined in this chapter, will serve as a benchmark for future measurements of progress and monitoring.

Hawaii's growing population creates demand for houses and vacation homes, and this is a strong driving force to proactive preventative management. Hawaii's landscape is being transformed from working agricultural lands to suburban and urban patterns of living. According to Population and Economic Projections for the State of Hawai'i (DBEDT, 2012), the population in Hawai'i is expected to increase 17.5% in the next 20 years from 1.36 million in 2010 to 1.60 million in 2030. Even though the population increase is down from a projected 30% increase predicted in the *2006 ORMP*, there will still be increased pressure on marine and coastal resources, existing infrastructure, and water and land use.

While academia, agencies, and communities have looked at ways to address these issues, they remain of critical concern in all parts of the State. Lack of enforcement, insufficient funding, lack of resources to address the issues, and lack of political will has sometimes stalled progress. Since the *2006 ORMP*, additional issues have come to the forefront of statewide concern. The issues discussed in this chapter were derived from plans developed since the *2006 ORMP*, as well as various stakeholder meetings and statewide Public Listening Sessions conducted during the ORMP update process.

This chapter is divided into four sections:

- Section One: *2006 ORMP* Driving Forces
- Section Two: Key Ocean-Related Issues Identified in Other Plans of State and Federal Agencies
- Section Three: Newly Identified Issues Expressed Concerning Ocean Resource Management
- Section Four: Promoting Collaboration and Stewardship

Throughout this chapter, you will see the following symbols:

	<p>To learn more about an issue, this icon will be accompanied with a link to existing information on an issue that has been raised.</p>
	<p>Members of the community have ongoing efforts to improve the quality of life and the natural environment in Hawai‘i. For more information on these efforts, this icon will direct you to their websites.</p>
	<p>To get in touch with an agency that has additional information and/or that is responsible for regulation and enforcement, contact information will be included next to this icon.</p>

### Section One: 2006 ORMP Driving Forces

The 2006 ORMP identified the following driving forces for change, which had evolved at that time as challenges to management of ocean resources. Many of these driving forces are still relevant today and are listed in the same order as they are found in the 2006 ORMP:

- Urbanization
- Impacts from Tourism
- Commercial and Recreational Ocean Uses
- Sea Level Rise and other Coastal Hazards
- Marine Debris
- Aquatic Invasive Species

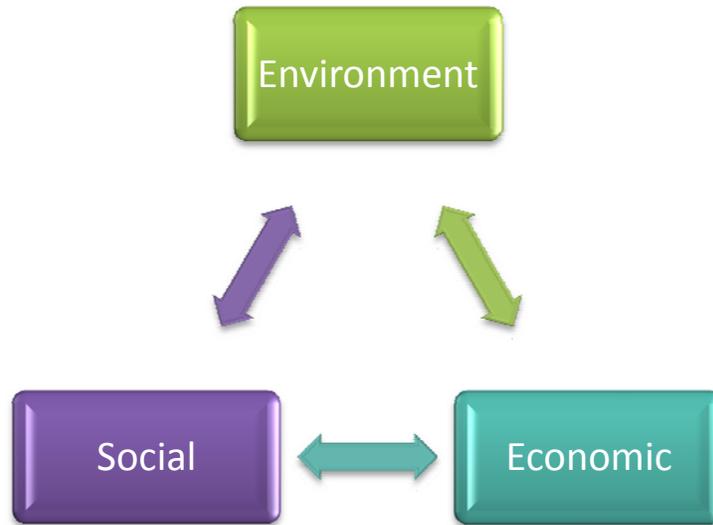
#### Urbanization

According to the 2010 U.S. Census, the state of Hawai‘i’s total population is 1,360,301 people, with 455,338 households. According to DBEDT, the population is expected to increase 140,000 people every ten years, and with that increase will come an increasing need for more housing, services, and urbanization.

This future population growth and accompanying growth in urbanization can be properly managed to preserve the state’s natural resources while allowing necessary economic growth. The updated goals and actions in this ORMP outline strategies to minimize impacts to the coastal environment through support of appropriate development.

Figure 3-1 shows that striking a balance between social needs, economic needs, and needs of the environment is interdependent. This is a diagram based on the definition of sustainability in Hawai‘i as defined in the *Hawai‘i 2050 Sustainability Plan*. Balancing the need to protect the environment can be done while driving the economy and providing social benefits to society. In other words, acquiring balance in one sector does not need to be at the expense of another.

Figure 3-1: Striking a Balance



**Impacts from Tourism**

Hawaii’s tourism industry is the lifeblood of the state’s economy. New visitor destinations and activities such as increased international visitors, the cruise ship industry, coastal-dependent resort development, increased marketing of the neighbor islands, and ecotourism alternatives can all be designed to explore Hawaii’s most sensitive and unique natural resources.

The *Hawai‘i 2050 Sustainability Plan* notes that tourism generates 20% of all economic activity and a quarter of the state’s tax revenue. The *Sustainability Plan* also notes that the state must provide incentives for industries to operate in more sustainable ways, recognizing that the visitor industry is a strong component of the state’s economy. The number of visitor arrivals is projected to grow as shown in Table 3-1, in turn creating magnified impacts to Hawaii’s natural resources.

Table 3-1: Visitor Forecast to 2030

	2004	Projections				
	(Actual)	2010	2015	2020	2025	2030
<b>Visitor arrivals (in thousands)</b>						
Hawai‘i County	1,281.2	1,420	1,570	1,700	1,830	1,980
Honolulu County	4,464.6	5,120	5,610	6,020	6,420	6,860
Kaua‘i County	1,020.9	1,230	1,360	1,470	1,580	1,700
Maui County	2,207.8	2,590	2,860	3,090	3,330	3,570
<b>State Total</b>	<b>6,991.9</b>	<b>7,810</b>	<b>8,620</b>	<b>9,290</b>	<b>10,010</b>	<b>10,780</b>

Source: *Planning for Sustainable Tourism, DBEDT (2006)*

During the Public Listening Sessions and outreach conducted for this plan, community members voiced concerns about what they saw as negative impacts from tourism including damage to coral reefs, harassment of endangered species, and increase in recreational user conflicts. The key to turning these into a positive and balanced visitor experience would be through education and outreach, which is one of the management priorities in this ORMP.

University of Hawai‘i (UH) Sea Grant College Program administers the Hanauma Bay Education Program, which educates more than 800,000 visitors annually on the value of marine resources and reef etiquette. Each visitor to Hanauma Bay in East O‘ahu is required to watch an educational film about preserving the reef by not walking on it, preserving the abundant marine life by not feeding it, and keeping trash and litter off the beaches and out of the water. There are many other non-profit, community, research, and government groups on all islands that provide education and outreach to visitors and residents alike on Hawai‘i’s coastal and ocean resources.

### Commercial and Recreational Ocean Uses

Hawaii’s oceans are used extensively for commerce, recreation, cultural practices, and transportation. Approximately 80% of all goods consumed in Hawai‘i are imported from out of state, and of those, 98% arrive by sea. The recreational value of the state’s oceans and waterways to the tourism industry and to those that live here has not been formally measured, however a study undertaken by the University of Hawai‘i Economic Research Organization (UHERO) in conjunction with UH Sea Grant will shortly provide specific data. Whether someone stand up paddles, rides a catamaran, or simply picnics beside the ocean has some intrinsic value to a state completely surrounded by the ocean. Cultural practices, such as *limu* (seaweed) gathering, salt farming, and fishponds are all connected to the ocean and water.

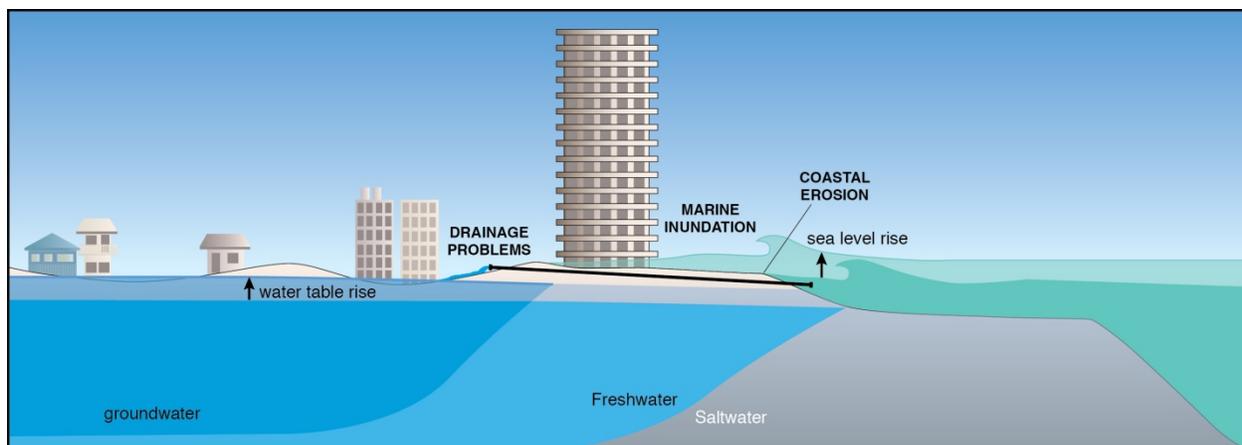
All of these uses of ocean and coastal resources can and do co-exist. One management priority of this updated ORMP is to address conflicting uses through non-judicial means. Another management priority is to create a coastal and marine spatial planning program which can identify map all of the uses of coastal and marine resources.

### Sea Level Rise and Other Coastal Hazards

Since the publication of the *2006 ORMP*, much scientific research and attention has been given to global climate change, including sea level rise. Sea level rise is defined as when the mean high tide level increases year after year. While many acknowledge that the sea level is rising, how much it rises is different in Hawai‘i than in other areas of the world. Factors such as the El Niño/La Niña-Southern Oscillation (ENSO), which is an occasional shift in winds and ocean currents centered in the South Pacific region, add to the variability of how much sea level rise one coastal location will see in comparison to another.

Figure 3-2 below, from Dr. Chip Fletcher at the UH School of Ocean and Earth Science and Technology (SOEST), illustrates the coastal hazards that can develop from sea level rise.

**Figure 3-2: Sea Level Rise and Other Coastal Hazards**



Source: Dr. C. Fletcher, University of Hawai‘i, SOEST

When the sea level rises, coastal erosion increases. When there are storm surges, this can increase the height of storm waves and cause marine inundation. In some locations, the saltwater can impact the level of the water table, causing a water table rise and inland flooding. The water table rise can cause drainage problems in interior areas, because there isn't anywhere for stormwater or rainwater to drain.

Coastal hazards such as beach erosion, inundation of land, increased flood and storm damage, saltwater intrusion into the freshwater lens aquifer, the rising of the water table, and more frequent or more powerful weather events all affect ocean resources. Proper coastal development, watershed management, and disaster preparedness in coastal regions are all tools to deal with the effects of sea level rise and coastal hazards.

### **Marine Debris**

Marine debris is defined as any solid material that is manufactured or processed and directly or indirectly disposed of or abandoned into the marine environment. Debris may enter directly from a ship, or indirectly when washed out to sea from rivers, streams, or storm drains. Marine debris includes a wide variety of items, including plastic bags, glass bottles, rubber slippers, derelict fishing gear, and abandoned or derelict vessels. Activities that create marine debris occur both on land and on the ocean. Marine debris can be categorized as chronic such as derelict fishing gear or episodic such as the Japan tsunami marine debris. The debris ranges in size from microscopic, such as broken pieces of plastic, to items weighing many tons, such as abandoned fishing vessels.

Marine debris is an ongoing problem worldwide, and Hawaii's position in the Pacific Ocean makes it no stranger to the multitude of marine debris washing up on the island's shores, much of it generated from distant shores. Because Hawai'i is at the center of the North Pacific Gyre, the islands become a hotspot for the aggregation of marine debris from across the Pacific.

Marine debris causes habitat damage such as to coral reefs, can transport alien species, and can cause harm to seabirds and other wildlife that accidentally digest it or become entangled in it. Marine debris can also lower the quality of life for residents and the satisfaction of visitors, as well as impose an economic cost.

According to the National Oceanic and Atmospheric Administration (NOAA), many federal efforts are underway to assess and plan for debris. NOAA and federal agencies are working with states and counties to develop planning guides to establish protocols for a variety of scenarios to address hazards to navigation, threat of pollution, and adverse impacts to public safety and health. Invasive species are also a concern, as they can be transported from other areas of the world to Hawai'i by attaching themselves to floating debris or as part of lost cargo. Another threat to the ocean is illegal dumping of solid waste at sea.

According to the *Hawai'i Marine Debris Action Plan (HI-MDAP)* (NOAA, 2010), there is a role for everyone, including federal, state, and county agencies, as well as community members and academia, in prevention of and dealing with marine debris. Beach clean ups are just one way of addressing marine debris, as pictured in Figure 3-3.

**Figure 3-3: Marine Debris Removed from Kanapou, Kaho‘olawe, Before and After Photos**



*Source: Kaho‘olawe Island Reserve Commission, Kanapou Cleanup*

The HI-MDAP identifies four goals to reduce marine debris, each accompanied with strategies to be implemented in the near future. The four goals are:

- Goal 1 – Backlog of Marine Debris at Sea Reduced;
- Goal 2 – Introduction of Solid Waste and Fishing Gear at Sea Decreased;
- Goal 3 – Number of Abandoned and Derelict Vessels Decreased; and
- Goal 4 – Land-based Debris in Waterways Reduced

The update of HI-MDAP and an approach to Japan tsunami marine debris are discussed in the next section.

### **Aquatic Invasive Species**

Aquatic invasive species (AIS) are non-native plants and animals introduced into a water body with the potential to harm the ecosystem, people, and/or the economy. The 2006 ORMP discussed AIS, and later in this ORMP there will be a discussion on terrestrial invasive species, which has similar consequences to the environment as relating to watersheds.

The Hawaiian Archipelago is home to 85% of the country’s coral reefs, and these ecosystems include a multitude of corals, fish, seaweeds, and other marine life, some seen nowhere else in the world. Protecting the fragile ecosystems as well as keeping waterways clear and preserving the environment that commerce and tourism are both dependent upon are all important to the State of Hawai‘i. Prevention and early detection are essential in the control of aquatic invasive species.



For more information on USCG Ballast Water Management, see: <http://www.uscg.mil/hq/cg5/cg522/cg5224/bwm.asp>

Aquatic invasive species can be introduced accidentally by sea faring vessels, as ballast water used by vessels and biofouling of submerged areas are the major mechanisms by which vessels

act as a pathway for introduction of marine alien species. In response to national concerns, the National Invasive Species Act of 1996 amended the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. The U.S. Coast Guard (USCG) has established both regulations and guidelines to prevent the introduction and spread of AIS.

Other ways of introduction of AIS are people dumping their non-native aquarium fish or plants into a neighborhood stream or river or AIS could be hitchhikers on marine debris. Not all non-native or introduced species become invasive species as some do not reproduce quickly, spread, or cause harm. An example of an invasive species that clogged a waterway is the floating water fern *salvinia molesta*, pictured below, which covered Lake Wilson and other waterways on O‘ahu in 2003 and cost over \$1 million dollars to eradicate.

**Figure 3-4: Salvinia Molesta**



The Aquatic Invasive Species Response Team (AIS Team) was established in 2005 as part of the *2003 State of Hawai‘i Aquatic Invasive Species Management Plan*. The AIS Team participates in certain cleanup events such as the “Habitattitude Campaign,” which asks the public to turn in unwanted aquarium pets and pond plants to participating pet stores and other drop off locations statewide. This helps to the introduction of non-native species into the state’s waterways.

Source: Department of Land and Natural Resources

Another AIS Team response is to the apple snail, which is an international invasive species that first originated in South America and pictured at right. It was first documented on the island of Maui in 1989, and there is now an international alert for apple snails. Apple snails present a serious threat to food security for anywhere there is a water-based food producing economy, such as taro cultivation in Hawai‘i. In some *loi*, or taro fields, crop loss can be as high as 20%, and if not controlled, these snails can consume an entire crop including corms, stems, and leaves in just one day. Outreach education to a broad sector of the state’s population, in multiple languages and approaches, is key to limiting further spread of this invasive species.

**Figure 3-5: Apple Snail**



Source: Department of Agriculture



For more information on Aquatic Invasive Species in Hawai‘i, see <http://www.hawaiiinvasivespecies.org/cgaps/aquatic.html>  
<http://www.state.hi.us/dlnr/dofaw/hortweeds/>  
[http://hawaii.gov/hdoa/pi/ppc/cm\\_as](http://hawaii.gov/hdoa/pi/ppc/cm_as)

## Section Two: Key Ocean-Related Issues Identified in Other Plans of State and Federal Agencies

Since completion of the ORMP in 2006, there have been changes and new advancements in the state. For that reason, the ORMP evaluation and update process is conducted every five years to assess current conditions and progress implementation. The ORMP seeks to provide linkages and common goals among state and county plans to assist in implementing initiatives already in place. Since the development of the 2006 ORMP, the following plans have played a major role in identifying pressures and issues important in Hawai‘i and aims to address them.

### Hawai‘i 2050 Sustainability Plan, 2008

The State Legislature mandated a State Sustainability Plan, and it was completed in 2008. The significance of the *Hawai‘i 2050 Sustainability Plan* is that it provides the State’s first definition of sustainability; a Hawai‘i that achieves the following:

- Respects the culture, character, beauty, and history of our State’s island communities
- Strikes a balance among economic, social and community, and environmental priorities
- Meets the needs of the present without compromising the ability of future generations to meet their own needs

The *Hawai‘i 2050 Sustainability Plan* has five goals:

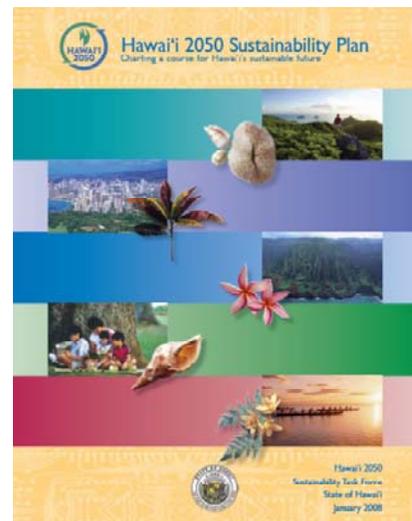
1. A Way of Life – Living sustainably is part of our daily practice in Hawai‘i;
2. The Economy – Our diversified and globally competitive economy enables us to meaningfully live, work, and play in Hawai‘i;
3. Environment and Natural resources – Our natural resources are responsibly and respectfully used, replenished, and preserved for our future generations;
4. Community and Social Well-Being – Our Community is strong, healthy, vibrant, and nurturing, providing safety nets for those in need;
5. Kanaka Maoli and Island Values – Our Kanaka Maoli and island cultures and values are thriving and perpetuated.

The strategic actions outlined in the plan serve as a guide implementing the sustainability goals. Once the strategic actions were developed, there was a desire for tangible targets and benchmarks in the form of priority actions and intermediate steps with a target date of 2020. These would serve as indicators of success or failure.

Goal 1 states that in order to be successful in living sustainably, the goal needs to be a collective action by all. Young people need to be engaged and education; furthermore, expanding public awareness.

Goal 2 identifies diversification as a means to safeguard our economy in the unpredictable future, making Hawaii’s economy more resilient.

Goal 3 is most directly connected to the ORMP as it deals with the environment and natural resources. 88.78% of Hawaii’s energy comes from petroleum, yet the U.S. Department of Energy indicates Hawai‘i is one of the best positioned states for renewable energy potential, with abundant wind, solar, geothermal, and other resources. Secondary impacts caused by the use of petroleum for energy include global warming and climate change, which are



anticipated to produce sea level rise and more intense and frequent storms, impacting coastal communities.

Goal 4 states, “*We have the makings of a community that when determined can achieve great things.*” The main focus of this goal relates to the community as a resource as well as community resilience.

Goal 5 acknowledges that Hawai‘i is the most ethnically diverse state in the nation, yet is not appreciated or described through data. There is a need to build on the ethnic diversity which significantly contributes to making Hawai‘i unique.

The following *Sustainability Plan* strategic actions and suggested benchmarks are directly related to the Perspectives and Management Goals outlined in the *2006 ORMP*:

- Reduce reliance on fossil fuels (Goal 3, Strategic Action 1): Pursuant to Act 95 (SLH 2004), Hawaii’s existing renewable portfolio standard goal was replaced with an enforceable standard. Under the new standard, called the Hawai‘i Clean Energy Initiative (HCEI, 2008), Hawai‘i will achieve 70% clean energy by 2030, with 30% from efficiency measures and 40% of electricity locally generated from renewable resources.
- Develop a sustainability ethic (Goal 1, Strategic Action 1): 85% of Hawai‘i residents consider sustainability to be a “critically important” issue to our state. The *2050 Sustainability Plan* also suggests setting benchmarks on various aspects of consumer behavior, including per capita water consumption; per capita alternate energy consumed; use of solar water heating sources; and participation rate in recycling programs.
- Preserve and perpetuate our Kanaka Maoli and island culture values (Goal 5, Strategic Actions 1 and 2): Hawai‘i residents attend a cultural event at least once a quarter.

The “Triple Bottom Line” approach, outlined in the plan, is where economic, community, and environmental goals are balanced.



### **A New Day in Hawai‘i, 2010**

The *New Day Plan* functioned as the platform for Governor Neil Abercrombie’s campaign in 2010 and now serves as the public policy roadmap for the State Administration. New projects and programs are now called “New Day” throughout the Administration if they fit within the contents of this document.

The New Day Plan includes sections on: Economy, Education, Energy, Environment and Natural Resources, Food and Agriculture, and Technology and Innovation. The ORMP is a policy document guiding New Day actions that relate to ocean resources.

Ideals of rebuilding the economy are focused around increasing self-reliance and protection of Hawai‘i’s resources by providing our own energy, growing our own food, and advancing sustainable tourism and development. The UH system has been an underutilized resource in Hawai‘i and the *New Day Plan* seeks to put UH in a leadership role for each element of the comprehensive plan, in turn, advancing technology and innovation. Energy as an economic enterprise will create “green” jobs and grow local businesses, and money will be retained in the state rather than investing in imported oil.

Consumption of the state’s natural resources must be sustainable over time with proper stewardship. Improvements to prevention, management, and response to invasive species are required. The state must prepare for impacts of climate change. A statewide integrated plan for solid waste needs to be developed.

Preservation of agricultural lands for growing food will allow Hawai‘i to be more secure against disruptions in food supply.

The *New Day Plan* states that all of these issues can be improved through collaboration and cooperation, which is identical to the ORMP’s *Perspective 3: Promoting Collaborative Governance and Stewardship*. The State Office of Planning participates and assists with implementation of the *New Day Plan* in the areas of Climate Change, Agricultural Renaissance, Energy Independent Hawai‘i, and Sustainability. These responsibilities connect with the Management Goals in the *2006 ORMP* that involve improving coastal water quality, ocean sustainability, ocean resource protection, and addressing invasive species.

**Figure 3-6: Kalo Production in Hanalei Watershed**



Source: Office of Planning



To learn more about A New Day in Hawai‘i, visit:  
[www.hawaii.gov/gov/about/a-new-day](http://www.hawaii.gov/gov/about/a-new-day)

### **2009-2013 University of Hawai‘i Sea Grant Strategic Plan, 2010**

The *2009-2013 University of Hawai‘i Sea Grant Strategic Plan* was completed in 2010. This Strategic Plan establishes a five-year work plan, and it is the first *UH Sea Grant Strategic Plan*.

UH Sea Grant is part of a national network of 32 university-based programs that promote better understanding, conservation, and use of coastal resources. UH Sea Grant is part of SOEST. They partner with NOAA’s Coastal Services Center, the Office of Ocean and Coastal Resource Management, and the National Centers for Coastal Ocean Science, among others. UH Sea Grant was designated as one of five founding Sea Grant College Programs in 1972.

The *Sea Grant Strategic Plan* is aligned with the *NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge*. This Strategic Plan was also guided by the *University of Hawai‘i at Mānoa Strategic Plan* and the *University of Hawai‘i at Mānoa Institutional Proposal*.

UH Sea Grant will concentrate their efforts in five areas:

1. Healthy coastal ecosystems
2. Sustainable coastal development
3. Safe and sustainable seafood supply
4. Hazard resilience in coastal communities
5. Sustainable coastal tourism

Figure 3-7: Instilling Principles of Coastal Tourism at Hanauma Bay Education Center



These five areas of concentration are the basis for the *Strategic Plan* Goals, which are each tied into several strategies, outcomes, and associated measurable objectives. The ORMP helped to inform the *2009-2013 UH Sea Grant Strategic Plan*. All of the Strategic Plan Goals are very similar to the Management Goals/Strategic Actions in the ORMP.

UH Sea Grant is currently updating their Strategic Plan for release sometime in 2013.

Source: UH Sea Grant’s Center for Sustainable Coastal Tourism

### Hawai‘i Marine Debris Action Plan, 2010

The *Hawai‘i Marine Debris Action Plan* (HI-MDAP) was published in 2010 by the NOAA Office of Response and Restoration, Marine Debris Program. This is the nation’s first ever State Marine Debris Action Plan and it is a federal plan

HI-MDAP builds upon the significant ongoing and past efforts of Hawaii’s marine debris community, including government agencies, nongovernmental organizations, academic institutions, and private entities.

The purpose of the HI-MDAP is to establish a comprehensive framework for strategic action to reduce the ecological, health, safety, and economic impacts of marine debris in Hawai‘i by 2020. HI-MDAP recognizes that the marine debris issue is complex, and there is a role for everyone in the implementation of the plan.

The overall goal of the HI-MDAP is to reduce ecological, health and safety, and economic impacts of marine debris in Hawai‘i by 2020. To accomplish this, the plans set forth four goals:

1. Reduce the backlog of marine debris
2. Decrease the introduction of solid waste and fishing gear at sea and coastal areas
3. Decrease the number of abandoned and derelict vessels
4. Reduce land-based debris in waterways

Figure 3-8: Marine Life Entanglement and Marine Debris



Source: Hawai‘i Marine Debris Action Plan

	<p>Any sightings of Japan Tsunami Marine Debris (JTMD) can be reported to contact DLNR at <a href="mailto:dlnr@hawaii.gov">dlnr@hawaii.gov</a> with a detailed description, any photos available, and date and location of JTMD. Or JTMD sightings can be reported to NOAA at <a href="mailto:disasterdebris@NOAA.org">disasterdebris@NOAA.org</a></p>
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This Marine Debris plan was written more than two years before the Sendai Earthquake and Japanese Tsunami (March 2011). In 2012, tsunami debris is just beginning to wash up on the northwestern tip of the U.S. and Alaska. It is predicted that 1.5 million tons of debris will reach North American shores, including everything from ghost ships, pieces of buildings, personal belongings, to smaller pieces of flotsam and jetsam. NOAA predicts debris will hit the Northern Hawaiian Islands in 2012, then move slowly onto Alaska, Canada, and the U.S. West Coast before circling back to Hawai‘i again. The

*Hawai‘i Marine Debris Action Plan* is currently being updated to address these issues for release in October 2012. Within the updated HI-MDAP, NOAA is coordinating federal, state, and local agencies as well as nongovernmental organizations to address the tsunami debris from Japan for Hawai‘i.

The state agencies that will implement the *Hawai‘i Marine Debris Action Plan* are DLNR, including the Kaho‘olawe Island Reserve Council, DOT Harbors Division, DOH Clean Water Branch and Environmental Health Administration, and the Office of Planning CZM Program. County agencies that will need to partner with the state include the Public Works and Environmental Services divisions that handle solid waste.

	<p>To learn more about the Hawai‘i Marine Debris Action Plan, visit: <a href="http://www.marinedebris.noaa.gov/projects/himdap.html">www.marinedebris.noaa.gov/projects/himdap.html</a></p>
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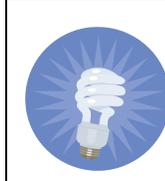
### **Hawaiian Islands Humpback Whale National Marine Sanctuary Plan Review Process**

The Hawaiian Islands Humpback Whale National Marine Sanctuary (Sanctuary) was designated by an act of Congress in 1992 as a single-species sanctuary to protect humpback whales and their habitat. As stipulated in a compact agreement signed in 1998, NOAA and the State of Hawai‘i “shall manage the Sanctuary through a cooperative partnership and consult on all management activities throughout the Sanctuary.”

In accordance with the agreement, the Governor designated a State Co-Manager to work in consultation with the Sanctuary Superintendent as an equal partner in the oversight of Sanctuary operations. NOAA and the State of Hawai‘i determined that co-managing a Sanctuary would provide additional resources and expertise to enhance the protection of humpback whales and their habitat. The Sanctuary is the only state-federal partnership that co-manages areas of the marine environment in the main Hawaiian Islands with twenty three percent of state waters being included within the Sanctuary. Sanctuary staff works to improve upon existing marine conservation and management efforts of state and federal agencies by providing inter-agency coordination and comprehensive protection through education, science, and outreach support.

The purposes and policies of the National Marine Sanctuaries Act (NMSA, 16 U.S.C. 1434(e)) requires NOAA to periodically review and evaluate the implementation of management plans and goals for each national marine sanctuary. Accordingly, NOAA must revise management plans and regulations as necessary to ensure that national marine sanctuaries continue to best conserve, protect, and enhance nationally significant living and cultural resources. Currently the primary purpose of the Sanctuary is to protect humpback whales and their habitat within the Hawaiian Islands. However, the Sanctuary was mandated by Congress in the 1992 Hawaiian Islands National Marine Sanctuary Act to identify and evaluate additional resources and ecosystems of national significance. During the last review of the

Sanctuary's management plan in 2002, numerous public comments requested the Sanctuary to increase its scope to include the conservation and management of other marine resources and species.



To learn more about the Hawaiian Island Humpback Whale National Marine Sanctuary and the management plan review process, visit:

[www.hawaiihumpbackwhale.noaa.gov](http://www.hawaiihumpbackwhale.noaa.gov)

The current management plan review (MPR) began in 2010, and this process will result in a new management plan for the Sanctuary. The MPR process helps to evaluate gaps in existing marine conservation efforts in Hawai'i and identify potential roles for the Sanctuary in future management. No final decisions have been made, and there continues to be many opportunities for public engagement.

There has been a high level of community engagement in the Sanctuary management plan review process. In the spring of 2010, statewide informational meetings were held to ensure that the public was aware of the opportunity to participate in the sanctuary public scoping process. A 90-day public scoping period held in the summer and fall of 2010 included 10 statewide public meetings and generated over 12,300 submissions.

The Office of Planning coordinated with the Sanctuary during the public scoping meetings to ensure that the comments received could be used to inform the update of the ORMP. Prior to each of the public scoping meetings, a letter from the Director of the State Office of Planning, addressed to meeting participants care of the Sanctuary, stated "The Sanctuary's management plan review coincides with our upcoming update of the ORMP, and the Sanctuary has graciously agreed to share the input they received from the public so that it can be used to inform our future update. In this manner, your concerns, comments, and suggestions will help influence several management efforts within the state."

Priority issues that were raised during the 2010 public scoping and comment period include:

1. Climate Change
2. Ecosystem Protections – Species and Habitats
3. Enforcement
4. Humpback Whale Protections
5. Management Effectiveness
6. Marine Animal Assessment and Response
7. Maritime Heritage
8. Native Hawaiian Culture
9. Ocean Literacy
10. Offshore Development
11. Water Quality



To learn more about The Sanctuary working group reports:  
[www.hawaiihumpbackwhale.noaa.gov/management/working\\_group\\_reports.html](http://www.hawaiihumpbackwhale.noaa.gov/management/working_group_reports.html)

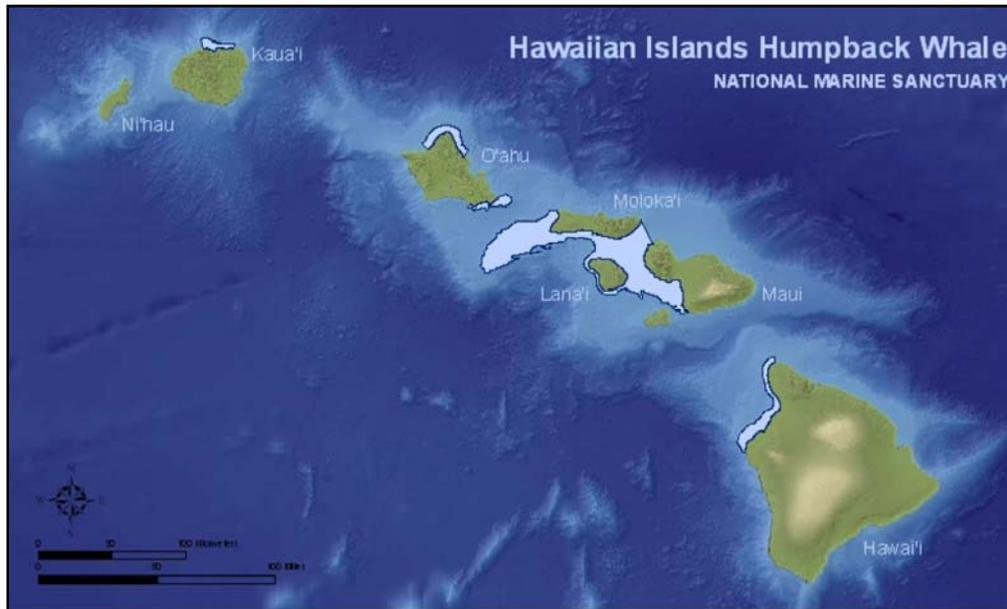
Working groups were formed by the community-based Sanctuary Advisory Council (council) to address the priority issues. In 2011, council working group participants contributed over 2,000 hours of service. Working groups were comprised of council members, cultural

advisors, local stakeholders, technical experts, and state and federal agency representatives. The groups identified gaps in current resource protection efforts and possible roles the sanctuary could play in future management efforts and developed management recommendations. Working group reports were presented at an open public meeting to the full council for their review and approval in January 2012. The reports contain over 150 management recommendations including shifting from a single-species to

an ecosystem-based sanctuary. The council forwarded all recommendation reports to Sanctuary management to be considered for inclusion in the draft revised management plan. The recommendations do not necessarily reflect the views of the Sanctuary, the State of Hawai‘i, or the National Oceanic and Atmospheric Administration.

These priority issues raised during the public comment period and addressed in the council management recommendation reports are also of interest to OP-CZM. OP has a non-voting member on the Sanctuary advisory council and Sanctuary staff participates on both the ORMP Working Group and Policy Group to improve coordination between the two programs.

**Figure 3-9: Hawaiian Island Humpback Whale National Marine Sanctuary Boundaries**



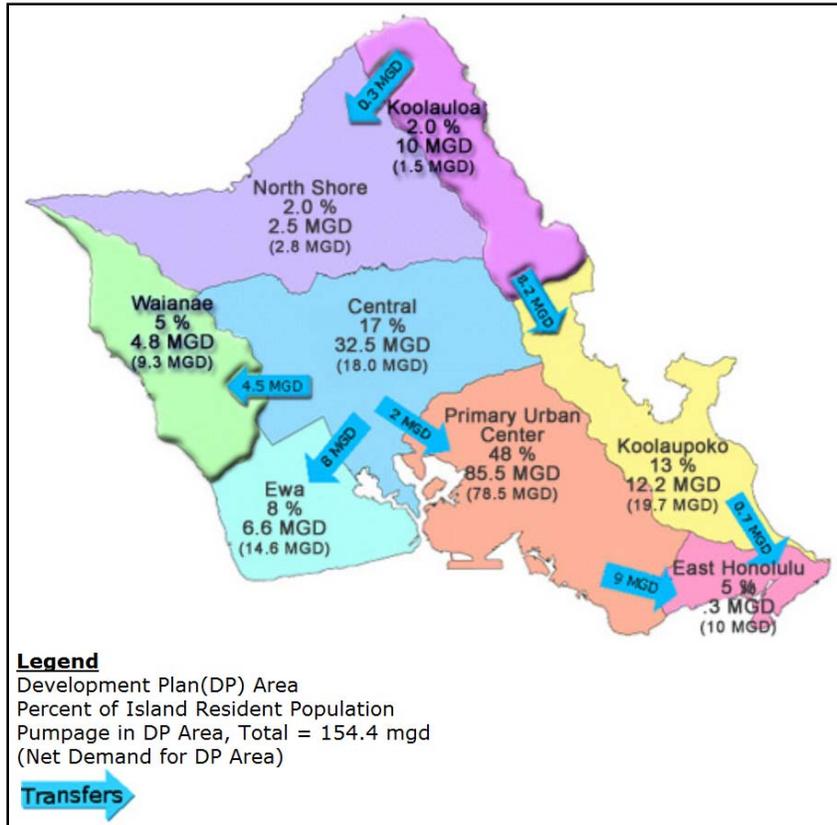
Source: Hawaiian Islands Humpback Whale National Marine Sanctuary

**Honolulu Board of Water Supply Watershed Management Plans**

The State of Hawai‘i Water Code (HRS Chapter 174C) and City and County of Honolulu Revised Ordinances of Honolulu (ROH Chapter 30) both require preparation of county water use and water management plans. O‘ahu has eight watershed regions, as shown in Figure 3-10 and designated as Development Plan (DP) areas under the City and County of Honolulu Department of Planning and Permitting (DPP). Watershed management plans are being completed for each DP area by the Honolulu Board of Water Supply (BWS). The goal of these plans is to provide short-, mid-, and long-range guidance for the watershed in keeping with the BWS’s mission statement “Water for life – Ka Wai Ola.”

	To learn more about the Honolulu Board of Water Supply Watershed Management Plans, visit: <a href="http://www.hbws.org/cssweb/display.cfm?sid=1406">www.hbws.org/cssweb/display.cfm?sid=1406</a>
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Figure 3-10: O‘ahu Development Plan Areas



Source: Honolulu Board of Water Supply

The Wai‘anae and Ko‘olau Loa Watershed Management Plans (WMPs) were adopted by the Honolulu City Council in August 2010 as Bills 9 and 10, respectively, revising Chapter 30 of the Revised Ordinances of Honolulu (ROH). The State Commission on Water Resource Management (CWRM) subsequently adopted the plans in March 2011. The Ko‘olaulapoko WMP was adopted in early 2012, and the North Shore WMP has been initiated.

The Ko‘olau Loa WMP identifies the following critical issues and principles:

1. Sustaining rural lifestyle of Ko‘olau Loa – ohana-centered, rural open spaces, limited growth;
2. Cultural and traditional water uses – watershed places, access, plants, stream water taro, fish;
3. Natural resources and watershed ecology (holistic view) – stream waters, biotas, riparian habitat, shoreline, ocean;
4. Healthy and plentiful water supply for community (*waiwai*) – source protection, limited future inter-district transfers;
5. Preserving agricultural uses and water supply – allocation for farming uses, future growth in agriculture; and
6. Watershed management responsibilities – *kuleana* (responsibility), access, community stewards.

The following issues were identified in the Ko‘olau Loa Watershed by stakeholders in the community:

1. Relationship of Watershed Plan to Ko‘olau Loa Land Use;
2. Traditional and Cultural Water Uses;
3. Ko‘olau Loa Ground Water Quantities and Yield Potential;
4. Policy Effects on Private Lands, Water Sources, and Systems;
5. Water Uses and Allocation;
6. Punalu‘u Watershed Alliance Model;
7. In-Stream Flow Standards, Species, and Protected Habitat;
8. Flooding Issues in Ko‘olau Loa Watersheds;
9. Kahuku Training Area – Stryker Brigade;
10. Polluted Runoff Control and Ocean Protection;
11. Policy Limits on Future Source Development in Ko‘olau Loa; and
12. Forestry Management.

### 2005-2015 Hawai‘i Tourism Strategic Plan, 2003

Figure 3-11: Cruise Ship at Honolulu Harbor



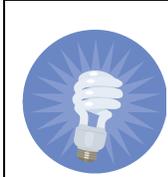
The *Hawai‘i Tourism Strategic Plan* has been in effect during the 2006 ORMP Demonstration Phase. Hawaii’s economy is dependent on tourism which in turn depends on the State’s ocean resources. The plan’s vision is to move towards a sustainable and responsible tourism industry for the State, and more specifically, “By 2015, tourism in Hawai‘i will: honor Hawaii’s people and heritage; value and perpetuate Hawaii’s natural and cultural resources; engender natural respect among all stakeholders; support a vital and sustainable economy; and provide a unique, memorable and enriching visitor experience.”

Source: 2005-2015 Hawai‘i Tourism Strategic Plan

The plan’s strategic initiative on natural resources outlines the following goals:

- Respect, enhance, and perpetuate Hawaii’s natural resources to ensure a high level of satisfaction for residents and visitors. This goal has the following issues:
  - There are competing demands for decreasing financial resources.
  - Improved coordination and collaboration are needed to leverage resources.
  - Increasing usage of sensitive natural resource sites is a cause for concern.
  - There are increasing numbers of tour activities in natural resource areas.
- To perform collaborative research and planning for use in the development of programs, policies, and plans that will positively contribute to the state’s economy, benefit the community and sustain Hawaii’s resources. This goal has the following issues:
  - Ever-changing events and trends impact tourism.
  - Tourism research is conducted by various entities but not often coordinated or shared.
  - Current methods do not always capture true public opinion.
  - County-specific strategic plans to address the visitor industry are not available.

The implementation framework includes the overall management plan, development of action plans, implementation of action plans, and county tourism strategic plans. Measures of success are based on resident sentiments, state and county tax receipts, visitor spending, and visitor satisfaction. Such measurements provide indicators of the health of Hawaii's visitor industry.



To learn more about the *2005-2015 Hawai'i Tourism Strategic Plan*, visit:  
[www.hawaii-tourism-authority.org/default/assets/File/about/tsp2005\\_2015\\_final.pdf](http://www.hawaii-tourism-authority.org/default/assets/File/about/tsp2005_2015_final.pdf)

While other government agencies identified key issues as they relate to ocean and coastal resource management, the process for this ORMP update helped to identify new and emerging issues expressed by community members and government agencies. These issues are discussed in the next section.

### Section Three: Newly Identified Issues Expressed Concerning Ocean Resource Management

Since the publication of the *2006 ORMP*, newly identified issues concerning ocean resource management have become additional driving forces for change. These newly identified issues were expressed by members of the community and ocean resource management agencies through the ORMP update process. Some of these issues are long term, such as climate change adaptation, while others have come to the forefront of the discussions on sustainability, such as food security.

#### **Climate Change Adaptation: Disaster Preparedness & Community Resilience, Flooding, and Coastal Erosion & Sedimentation**

Climate change has been documented to have impacts on the atmosphere, coasts, and marine resources. Mitigation and adaptation to climate change and coastal hazards need to be addressed in order to combat the pressure that exist today, as well as prepare Hawai'i for future impacts. Because of the cumulative impacts of climate change, the state has put a focus on adaptation. Public awareness of this issue has grown since the *2006 ORMP* making climate change adaptation a primary issue.

Global warming is predicted to cause an increase in frequency and power of both storm surge and hurricanes. One study suggests that peak hurricane wind speeds will increase by 5 to 10 percent by the end of the 21st century. A 1-meter rise in sea level would enable a 15-year storm to flood areas that today are only flooded by a 100-year storm (IPCC 1998). Changes in precipitation are also expected which impacts the amount of fresh water in Hawaii's watersheds.

While the prevention of global climate change is largely beyond State control, proactive planning to mitigate impacts is vital to the state's economy and the health and safety of Hawaii's residents and visitors. The temperature of the Earth is predicted to increase between 2.0 to 6.3°F (1.1 to 3.5°C) by the end of the century (Meehl 2005), causing a wide range of increased threats to the coastal area and marine ecosystems. Global warming has increased the ocean's temperature over the past few decades, which will likely increase the frequency and severity of coral bleaching (Barnett 2005).

An added threat to corals is the increased levels of carbon dioxide emissions, a greenhouse gas, which is changing the ocean's chemistry. The added carbon dioxide causes a decrease in the pH of the water; in turn, making the ocean more acidic which decreases the rate of calcium carbonate by coral polyps. Without healthy coral reefs, entire ecosystems are at risk.

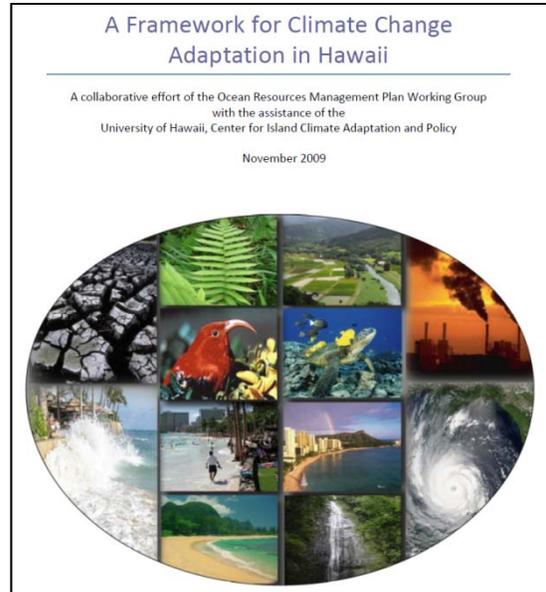
The Intergovernmental Panel on Climate Change (IPCC) predicts that worldwide sea level will rise 1.5 feet over the next 100 years, and has outlined numerous impacts from this rise on coastal communities including: beach erosion, inundation of land, increased flood and storm damage, saltwater intrusion into

the freshwater lens aquifer, changes in precipitation, increased levels of land-based pollutants to coastal waters including sediments, nutrients and contaminants, and more frequent, longer, and more powerful El Niño and La Niña events.

The threat of sea level rise has triggered counties to reassess current shoreline setback requirements due to coastal erosion. As coastal development expands, so does the risk to communities and their infrastructure. According to the 2012 U.S. Geological Survey *National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Island*, the beaches of Kaua‘i, O‘ahu, and Maui are eroding at an average long-term rate of -0.11 meters per year. Beach management plans have been prepared to combat sea level rise, because the retreat of Hawaii’s beaches will impact the residents’ quality of life and the visitor industry.

All of these impacts will contribute to a greater vulnerability of communities living in coastal areas, endangering life and property. Existing development and present coastal planning do not always take this changing environment into account.

**Figure 3-12: Impacts on Hawaii’s Resources from Climate Change**



Source: *A Framework for Climate Change Adaptation in Hawaii*

In 2009, the ORMP Working Group and the University of Hawaii’s Center for Island Climate Adaptation and Policy (ICAP) prepared *A Framework for Climate Change Adaptation in Hawaii*. Topics included building a climate change adaptation team, developing and adopting a long-term vision, identifying planning areas and opportunities relevant to climate change, scoping climate change impacts to major planning sectors, conducting a vulnerability assessment, and conducting a risk assessment. Such planning efforts aids in disaster preparedness and build resilient communities.

A core group of ORMP partners drafted climate change policy legislation that became part of the Governor’s 2012 Legislative Packet as SB 2745. This climate change adaptation bill passed the 2012 Legislature and was signed by Governor Neil Abercrombie as Act 286.

	<p>To learn more about <i>A Framework for Climate Change Adaptation in Hawaii</i>, visit:  <a href="http://www.hawaii.gov/dbedt/czm/ormp/reports/climate_change_adaptation_framework_final.pdf">www.hawaii.gov/dbedt/czm/ormp/reports/climate_change_adaptation_framework_final.pdf</a></p>
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**Watershed Management: Water Quality and Water Quantity**

There are over 500 watersheds in the State of Hawai‘i, according to the *Hawai‘i Watershed Guidance* (Office of Planning, 2010). The Department of Land and Natural Resources, the Department of Health, the Office of Planning, and the various county Boards of Water Supply manage most of the state’s watersheds; however, many of the watersheds are also in private property. In addition, because of their vast size and limited accessibility, a variety of stakeholders partner in order to manage and improve functionality of the watersheds. Watershed management takes into account the quality as well as quantity of water within a given watershed; furthermore, freshwater flow into streams, estuaries, anchialine ponds, and nearshore waters is as important as the quality of the water.

Another issue facing Hawaii's coastal areas is sedimentation from rivers, streams, and other runoff which cause changes in water depth and water quality. Large sediment load in some of Hawaii's bays such as Hanalei Bay, Kauai has been attributed to removal of ground cover and surface disturbances by animals and humans in watersheds, which accelerate erosion rates and sediment generation. The Hanalei



Hanalei Watershed Hui, Kauai  
[www.hanaleiwatershedhui.org/](http://www.hanaleiwatershedhui.org/)

Watershed Hui has worked to improve the watershed through various partnerships, education, and stakeholder involvement.

The *Hawai'i Watershed Guidance* defines impaired waterbodies as those which do not meet Hawaii's water quality standards that support the designated use. Watersheds of particular concern are high-quality waters threatened by changing land uses. Threats to healthy watersheds may be local (new development or change in land use), regional (spread of invasive species), and global (drought or flooding caused by climate change). While there is always going to be a naturally deposited element of high islands in torrential tropic environments eroding to low islands, the human impacts are the greatest (with construction and agriculture the main culprits). Part of the answer for addressing watershed issues is education.

While land-based pollution from agricultural runoff may be declining, urban storm-water runoff from construction activities and increased impervious surface cover has taken its place. Polluted surface water runoff, combined with an aging sewage system incapable of handling system overloads, is threatening coastal water quality. According to the U.S. Environmental Protection Agency, 64% of Hawaii's streams are considered "impaired" by pollutants. Furthermore, as population density increases along shoreline areas, landscape hardening to protect property has become a serious coastal issue. Channelized streambeds for floodwater control exacerbate water quality problems and contribute to stream and estuarine habitat loss. Seawalls and other hardened shoreline structures to protect coastal properties exacerbate coastal erosion and beach loss (Fletcher et al. 1997). Currently, only the Islands of O'ahu, Kaua'i, and Maui have documented erosion rates, and the University of Hawai'i SOEST plans to document erosion rates for the other islands in the near future.

Urban and agricultural lands are major sources of nonpoint source pollution. Genetically Modified Organism (GMO) crops, pharmaceutical contamination, injection wells, and cesspools were raised as examples of pollution that is occurring. Stream diversions and wells that affect surface waters have changed the water flow to wetlands, streams, estuaries and nearshore waters. Careful and appropriate use of the land and freshwater is required to maintain the diverse array of ecological, social, cultural, and economic benefits we derive from the sea.

### Shoreline Access & Conflicting Uses

Shoreline access is a right guaranteed in the state constitution (Constitution of the State of Hawai'i, Article 12, Section 7, "Traditional and Customary Rights"). The landmark 1995 Hawai'i State Supreme Court case referred to as PASH or Public Access Shoreline Hawai'i reaffirmed these rights, and HRS Section 46-6.5 states that the counties, in the subdivision process, must ensure public access to land below the high-water mark on any coastal shoreline.

Yet some feel that access is being limited, either through restriction of parking, unavailability of public access in areas that are land locked, or the restriction of protected Native Hawaiian gathering rights. New resorts constructed on undeveloped shorelines may reduce public access to ocean resources and degrade scenic vistas. Increased marine-related tourist attractions, including whale and dolphin watching, shark feeding, charter fishing, parasailing, jet skiing, swimming, snorkeling and diving, can result in resource use conflicts and threaten the condition of ocean and coastal resources. How shorelines are developed

and the way coastal water quality, beaches, and coral reefs are managed are fundamental to the growth and sustainability of Hawai‘i.

**Figure 3-13: Recreation at Hanalei Bay, Kaua‘i**



*Source: Office of Planning*

### **Damage to Coral Reefs**

Coral reefs are many times called the “rainforests of the sea” due to their complex and rich biodiversity. According to the Sustainability Plan, there are 7,000 known species of coral represented in 410,000 acres of living reef in the main Hawaiian Islands. More than one quarter of these species are only found in Hawai‘i.

Several threats to coral are urban and agricultural runoff, the acidification of oceans, and aquatic invasive species. Many of the Management Priorities in this ORMP address ways to improve the sustainability of Hawai‘i’s corals. The AIS Team discussed earlier is working on a method to eliminate snowflake coral from the pier at Kauai’s Port Allen. Snowflake coral is an invasive soft coral that can overgrow and smother black coral. The AIS Team is using an innovative technique to wrap pier pilings with industrial plastic, smothering the invasive coral. The Nature Conservancy of Hawai‘i and UH are using a large underwater sea vacuum to suction clumps of seaweed from the reef in Kāne‘ohe Bay. The sea vacuum, called the “Supersucker” can remove up to 750 pounds of invasive seaweed per hour, and this removes the large pieces. The smaller particles remain and can re-attach themselves to the reef and continuing growing, and the next step is to experiment with native seaweed eaters such as sea urchins to control the re-growth.

Figure 3-14: Hawai‘i Coral Reef



Source: The Nature Conservancy

The Makai Watch Program was developed to enhance the management of nearshore marine resources by providing community members opportunities for direct involvement in management activities. This program builds community awareness, monitors biological and human use, and encourages compliance. As of 2011, there are currently a total of eight Makai Watch Groups recognized by DLNR: Puako, Kaupulehu and Kukio, on the island of Hawai‘i; Ka‘anapali/Kahekili on the island of Maui; Pupukea-Waimea, Maunalua Bay, and Waikīkī, on the island of O‘ahu; and Hanalei and Hā‘ena on the island of Kaua‘i.

**Endangered Species-**

One-third of all endangered species in the United States are in Hawai‘i. Endangered species are federally listed which allows for federal regulation in state waters; furthermore, limiting what is allowed to be done on the local level.

Other protected and endangered species in the marine environment such as the Humpback Whale and the Hawaiian Monk Seal are discussed elsewhere in this report. Many of the same issues, such as user conflicts, recovering populations, and competing for resources apply.

**Terrestrial Invasive Species**

Terrestrial Invasive Species are similar to AIS, except they occur on land. The introduction of a non-native species can interrupt and damage the land ecosystem. This is important to ocean and coast resource management because what happens at the top of the ridge can affect water quantity and the ocean’s water quality.

	<p>There are Invasive Species Committees on O‘ahu, Maui, Moloka‘i, Kaua‘i, and Hawai‘i Island. For more information on these committees, see: <a href="http://www.hawaiianinvasivespecies.org/iscs/">www.hawaiianinvasivespecies.org/iscs/</a></p>
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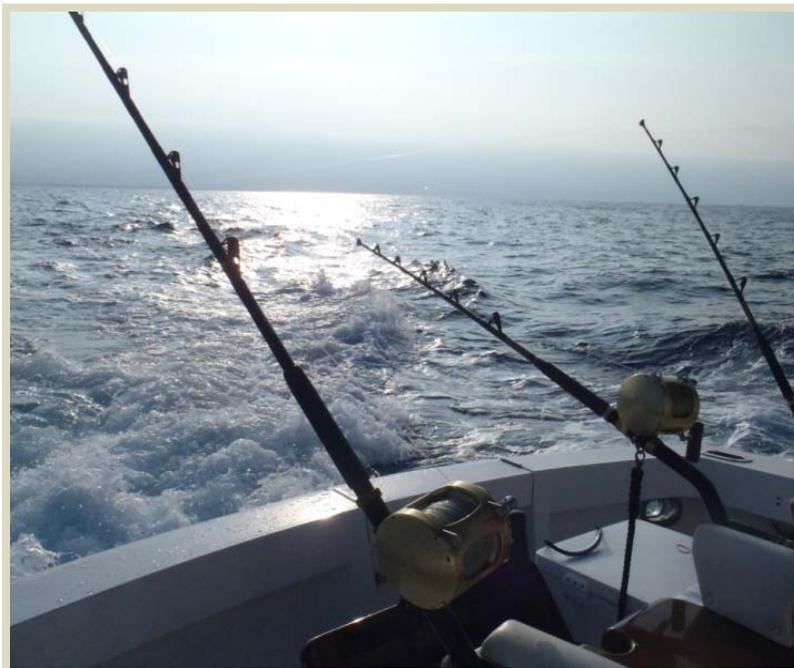
An issue discussed in Chapter VI, Management Priorities, is the damage that hooved animals can do to the watershed. Hooved animals are also referred to as ungulates and include pigs, goats, deer, and sheep. Some were introduced the islands in the late

1700s, and many became feral. The wild populations graze and root around the native forests, destroying ground cover and causing large swaths of land to erode. These feral ungulates may also introduce invasive species. Ungulate barriers such as fencing have been used in forest and watershed to conserve the watershed and forests. Other terrestrial invasive species such as the brown treesnake are important to keep out of the islands because their introduction would wipe out native bird populations, and affect the biodiversity of the forests.

**Food Security: Aquaculture and Fishpond Restoration**

Those who rely on subsistence fishing note that fish stocks are not as plentiful as they once were. Issues contributing to the dwindling supply include sedimentation, competition with invasive species, and aquarium fish collection. Invasive species such as Ta‘ape and non-native seaweed are pushing out native species that residents rely on as a food source. In addition, the depletion of coral reefs in turn causes a loss of biodiversity which impacts not only the island population’s ability to recreate and subsist, but loss to state’s chief income producer, tourism. It is also an indicator of land based pollution that is infiltrating the marine coastal waters system.

**Figure 3-15: Commercial Fishing off Kona Coast**



Source: Office of Planning

The debate on open ocean and nearshore aquaculture is a contentious topic as new aquaculture facilities are being proposed. Industries in place or being considered include ahi, clams, oysters, moi, and sea bass. Aquaculture is anticipated to help address the food security issue. Some opposing views see aquaculture as a potential source of pollution and creating competition for local fishers.

One method to diversify food production is Native Hawaiian Fishpond Restoration. Ongoing efforts to restore existing fishponds are occurring, such as in He‘eia, on the island of O‘ahu and on the island of Moloka‘i. These efforts are looked at as an opportunity to address food security, as well as instill the Native Hawaiian culture for generations to

	<p>He‘eia Fishpond Restoration, O‘ahu <a href="http://www.paepaeoheeia.org/">http://www.paepaeoheeia.org/</a></p>
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come. The sentiment is that Native Hawaiians thrived using such methods, so carrying on the approach to food production would be a sustainable way of living.

### **Military Use of Lands**

The military presence is an integral part of Hawaii's history and present as well as a major driver of the state's economy. National and homeland security requires that access to certain shorelines, such as at Pearl Harbor, are off limits to the general public, pre-empting state laws. On occasion, the military will allow access to certain beaches, such as at Bellows Air Force Station Beach in Waimānalo. Further collaboration between the state and the military bases may help to open up more shoreline, even on a limited basis, for recreation and fishing.

On Marine Corps Base Hawai'i in Kāne'ohe, the U.S. Marines care for the Nu'upia Ponds Wildlife Management Area. These eight interconnected ponds and wetlands cover 517 acres, and are home to the endangered Hawaiian Black-necked Stilt and well as the Hawaiian Coot, Hawaiian Moorhen, and the Kōloa Duck. Each year, the Marines prepare this site for the endangered Hawaiian Stilt breeding season between March and September by breaking up invasive pickleweed so that the Hawaiian Stilt can nest.

Ordnance leftover from WWII and training exercises in the ocean and along the coastline is a concern in some areas of Hawai'i. The most extreme example of this would be the uninhabited Kaho'olawe, which was used as a U.S. Navy training facility for several decades. Military ordnance has also been reported by community members off the Wai'anae Coast on O'ahu and North of Kailua-Kona on Hawai'i Island. Continued collaboration between the State of Hawai'i and assigned military liaisons can assist in removal of ordnance. The Kaho'olawe Island Reserve Council's work to restore Kaho'olawe should also continue.

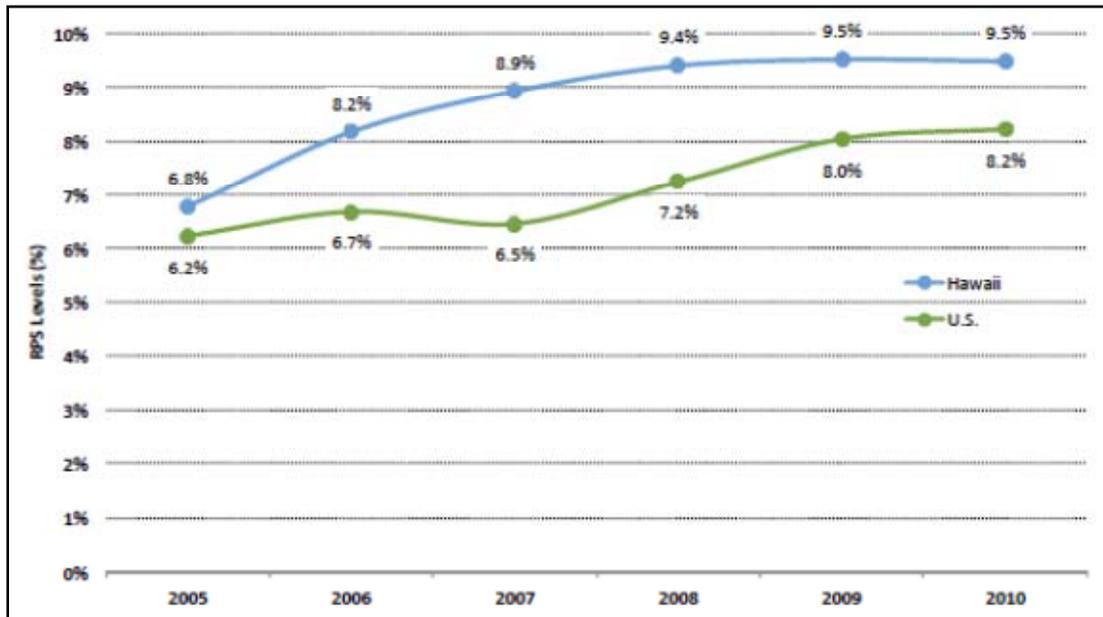
### **Alternative Energy**

Under the Hawai'i Clean Energy Initiative (HCEI) and subsequent RPS mandates, Hawai'i electric utilities must produce at least 15% of the electricity sold by clean energy technologies by 2015. With the projects currently under development or planning, Hawai'i is on target to meet this goal. However, the goals of 25% renewable generation by 2020 and 40% renewable generation by 40% leave much work to be done. Hawaii's renewable electricity generation as a percentage of total generation is approximately 11-12%, according to annual Renewable Portfolio Standards (RPS) reports submitted by the electric utilities to the Hawai'i Public Utilities Commission. In 2010, Hawai'i was at 9.5% of renewable electricity generation, which at the time was approximately 1.8% higher than the rest of the United States as shown in Figure 3-16 on the following page.

The *Hawai'i 2050 Sustainability Plan* reported that transportation accounts for nearly half (48%) of Hawaii's energy consumption, compared with industrial (25%), commercial (14%), and residential (13%) uses. This includes both ground and aviation fuel consumption. According to Governor Abercrombie's *A New Day in Hawai'i Plan (2010)*, Hawaii's most important economic enterprise is to pursue energy independence. This could include wind, solar, hydro, ocean thermal, marine hydrokinetic, biomass and geothermal sources.

To increase the state's Renewable Portfolio Standards percentage and lower the state's dependence on foreign oil imports, over 75 renewable energy projects have been proposed throughout Hawai'i. Many of these projects will impact the ocean and coastal resources in various ways, including but not limited to: ecologic impacts from marine infrastructure, effluent discharges (tempered and/or processed), visual impacts, and recreational and commercial impacts. Coupled with the newly formed Hawai'i Outer Continental Shelf (OCS) Task Force, the sustainable development of Hawaii's marine resources is a major component of HCEI.

Figure 3-16: Hawai'i Renewable Energy Generation 2005-2010



Source: State of Hawai'i Energy Resource Coordinator's Annual Report 2011

Proper siting and cumulative planning of renewable energy projects is critical to the sustainable use of our indigenous ocean resources. The Hawai'i State Energy Office within DBEDT works with impacted stakeholders and regulatory agencies to help ensure individual projects are developed in consideration of local and statewide impacts, both short term and long. Some renewable energy power plants—such as wave energy devices or offshore wind—would directly impact marine resources because of their location. Even land-based renewable projects, such as geothermal and bioenergy, could affect the ocean via effluent or run-off discharges or if the Hawaiian Islands' electricity grids are linked by an undersea cable. Hawai'i's present reliance on imported fossil fuels—oil and coal—also can significantly impact the ocean since these fuels are shipped overseas, making the ocean and coasts susceptible to spills and other accidents. The Pacific Ocean is an integral part of Hawai'i's environment, culture, and economy, and has vast potential to support the production of renewable energy. Managing our energy resources sustainably will, at the same time, help to protect our unique ocean resources.

## Section Four: Promoting Collaboration and Stewardship

Working together and sharing knowledge, experience, and resources will improve and sustain our efforts to care for the land and sea. All issues require collaboration and stewardship.

Many issues also present multi-jurisdictional challenges, which can be overcome with the kind of collaboration exhibited at the ORMP Policy Group and ORMP Working Group. For example, the State's ocean resources constitute three miles seaward of the coastline. Within that three mile boundary, there are other federal agencies that have jurisdiction such as the Sanctuary, the U.S. Navy for military operations, and the U.S. Coast Guard for rescue and enforcement.

Federal agencies are more and more deeply involved and in general, they have greater financial resources than state and county agencies. Partnering with federal agencies will enable the State of Hawai'i to stretch its dollars and resources to accomplish many of the new ORMP Management Priorities outlined in Chapter VI.

Partnering with county planning agencies enables the ORMP partnering groups to understand and incorporate the plans of individual counties. Many non-governmental agencies have also become partners in collaboration and stewardship, helping to further the ORMP Three Perspectives through their collective actions.

# IV. Integrated and Coordinated Approach to Management of Ocean Resources

## Introduction

This chapter discusses multiple approaches to the management of ocean resources, and thus the importance of integration and coordination. Topics covered include:

- Which federal, state, and county agencies are involved
- Framework for National Ocean Policy
- Marine Management Areas and Sanctuaries
- Place-Based Ocean and Coastal Resource Management

National Ocean Policy is new since the *2006 ORMP*. The National Ocean Policy and the National Priority Objectives call for a framework for implementation: The Pacific Regional Ocean Partnership and the Hawai'i Sub-Regional Ocean Partnership, which are both in the early stages of formation. The National Ocean Policy, with nine priority objectives, recommends as one of the priorities developing coastal and marine spatial planning as a comprehensive, integrated, and regionally-based tool for planning and managing coastal and marine uses.

Place-based management is critical, and it involves both government and the community working in alliance. There is a role for traditional management practices of the land and the sea. Appendix A at the end of this plan provides selective resources and references for community organizations seeking funding and further involvement as stewards of the ocean.

## State, Local and Federal Agencies: Who Does What?

Many government agencies and authorities participate in the management of ocean and coastal resources. While there are overlaps in interest, each governmental agency has its own roles and responsibilities. The OP-CZM Program recently published *Sustainable Management of the Islands* (December 2011), which describes the network of resource agencies for coastal zone management and ocean resource protection. Agencies involved in ocean resource and coastal zone management are shown in Table 4-1 for state government, Table 4-2 for local agencies and Table 4-3 for federal agencies.

**Table 4-1: State Agencies involved in ocean resource and coastal zone management**

State Agency	Responsibilities for Ocean Resource and Coastal Zone Management
Office of Planning, Coastal Zone Management Program	<ul style="list-style-type: none"> <li>• CZM Program</li> <li>• Build capacity for community participation in natural and cultural resources management</li> <li>• Develop community-based frameworks and practices for identifying and mitigating ocean recreational use conflicts</li> <li>• Develop legislative and administrative proposals to improve management of natural resources</li> <li>• Monitor and evaluate Ocean Resource Management Plan implementation</li> <li>• Conduct a baseline study of ocean recreation and tourism</li> <li>• Coastal Nonpoint Pollution Control Program (CNPCP) in partnership with DOH</li> <li>• Coastal Access</li> <li>• Development of a territorial sea plan</li> <li>• Identify channelized streams within DLNR Watershed Partnerships for restoration and revitalization of wetland and estuarine habitats</li> <li>• Training on CZM and SMA laws and regulations for County Planning Department Staff and Planning Commissions</li> </ul>
Department of Health, Environmental Health, Clean Water Branch	<ul style="list-style-type: none"> <li>• Improve coastal water quality</li> <li>• Reduce pollutant loads from resident, agricultural, and commercial land uses</li> <li>• National Pollutant Discharge Elimination System (NPDES) permits</li> <li>• Implement watershed implementation plans, total maximum daily load implementation plans</li> </ul>
Department of Agriculture, Aquaculture Development Program	<ul style="list-style-type: none"> <li>• Minimize the spread of marine alien and invasive species into and throughout archipelagic waters through inspection and enforcement</li> <li>• Develop ecosystem-based approaches for nearshore fisheries management</li> <li>• Establish and institutionalize approaches for restoring, operating, and preserving ancient Hawaiian coastal fishponds and salt ponds</li> <li>• Plan and develop sustainable commercial aquaculture</li> <li>• Enhance the conservation of Hawai‘i’s marine protected species, unique habitats and biological diversity</li> </ul>
Department of Transportation, Harbors Division	<ul style="list-style-type: none"> <li>• Improve coastal water quality by reducing marine sources of pollution</li> <li>• Provide appropriate waste management infrastructure to support commercial marine facilities</li> <li>• Minimize introduction and spread of alien species</li> </ul>
Office of Hawaiian Affairs	<ul style="list-style-type: none"> <li>• Establish and institutionalize approaches for restoring, operating, and preserving ancient Hawaiian coastal fishponds and salt ponds</li> </ul>
Hawaii Department of Land and Natural Resources (DLNR), Division of Ocean Boating and Ocean Recreation (DOBOR)	<ul style="list-style-type: none"> <li>• Provide appropriate waste management infrastructure to support recreational marine facilities</li> </ul>
DLNR, Division of Conservation and Resources Enforcement (DOCARE)	<ul style="list-style-type: none"> <li>• Improve enforcement capacity and voluntary compliance with existing rules and regulations for ocean resource protection</li> <li>• Develop community-based frameworks and practices for identifying and mitigating ocean recreational use conflicts</li> </ul>

State Agency	Responsibilities for Ocean Resource and Coastal Zone Management
DLNR, Division of Forestry and Wildlife (DOFAW)	<ul style="list-style-type: none"> <li>• Reduce soil erosion from upland forest ecosystems and conservation lands</li> <li>• Enhance the conservation of Hawai'i's marine protected species, unique habitats and biological diversity</li> <li>• Natural Area Reserves System</li> <li>• Formalizing Watershed Partnerships</li> </ul>
Commission on Water Resource Management (CWRM)	<ul style="list-style-type: none"> <li>• Commission on Water Resource Management permits and enforcement</li> <li>• Establish criteria to determine water availability and sustainable yield analyses for aquifers and watersheds</li> <li>• Develop long-range plans for the protection, conservation, and management of water resources</li> <li>• Formulate drought management plans</li> <li>• Implement Commission policies, procedures, and rules on stream protection and instream flow standards, water development, and usage established in conformance with the State Water Code</li> </ul>
DLNR, Office of Conservation and Coastal Lands (OCCL)	<ul style="list-style-type: none"> <li>• Fisheries management</li> <li>• Protected area management</li> <li>• Hawaiian fishpond reconstruction and fishpond repair programmatic permit</li> <li>• Hawaiian salt ponds</li> <li>• Beach Access</li> <li>• OCCL aquaculture permitting, including management guidelines</li> <li>• Conservation District Use Applications</li> <li>• <i>Hawai'i Shoreline Management Plan</i></li> <li>• DLNR Coastal Erosion Management Plan (COEMAP)</li> <li>• OCCL Small Scale Beach Nourishment Program (SSBN)</li> <li>• DLNR Comprehensive Coastal Policy</li> <li>• <i>Coastal Hazard Mitigation Guidebook</i></li> <li>• <i>Beach Vulnerability Rating Project (BVR)</i></li> <li>• <i>Historical Shoreline Erosion Studies (Kaua'i, O'ahu, Maui)</i></li> <li>• Shoreline Assessment Model (SAM)</li> <li>• Enforce removal of unauthorized coastal structures</li> <li>• Enforce Act 160 (encroaching vegetation)</li> <li>• Public-private partnerships for beach restoration</li> </ul>
University of Hawai'i <ul style="list-style-type: none"> <li>• UH Economic Research Organization (UHERO)</li> <li>• School of Ocean and Earth Science and Technology (SOEST)</li> <li>• Pacific Islands Ocean Observation System (PacIOOS)</li> <li>• Sea Grant Sea Grant College Program, Center for Island Climate Adaptation &amp; Policy (ICAP)</li> </ul>	<ul style="list-style-type: none"> <li>• Works with OP-CZM on economic studies</li> <li>• Works with OP-CZM on water quality monitoring, climate change, shoreline erosion, beach loss mitigation, marine invasive species, educational curriculum on coastal and ocean resources</li> <li>• <i>Coastal Hazard Mitigation Guidebook</i></li> <li>• <i>Historical Shoreline Erosion Studies (Kaua'i, O'ahu, Maui)</i></li> <li>• National ocean observing network</li> <li>• Data management, data archive, and data visualization</li> </ul>

**Table 4-2: County Agencies involved in ocean resource and coastal zone management**

County Agency	Responsibilities for Ocean Resource and Coastal Zone Management
Department of Planning and Permitting, O’ahu Department of Planning (Maui, Kaua’i, Hawai’i)	<ul style="list-style-type: none"> <li>• Enforcement of building codes</li> <li>• Issuance of building permits</li> <li>• Issuance of Special Management Area (SMA) permits</li> <li>• Best Management Practices (BMPs)</li> <li>• Land Use or Zoning Ordinances as tool for land-ocean connection, includes SMA and subdivision ordinances</li> <li>• Coastal erosion studies</li> <li>• Enforcement of public beach/shoreline access</li> <li>• Partnerships for beach restoration projects</li> </ul>
Board of Water Supply	<ul style="list-style-type: none"> <li>• Watershed management plans</li> <li>• Watershed partnerships/watershed protection and restoration projects and programs</li> </ul>
Environmental Services Department, O’ahu Wastewater Department or Public Works Departments (Maui, Kaua’i, Hawai’i)	<ul style="list-style-type: none"> <li>• Water quality monitoring</li> <li>• Oversight of county-owned sewer system, including repair, maintenance and construction</li> <li>• Replacement of cesspools</li> <li>• Inventory of individual wastewater disposal systems in coastal areas</li> <li>• Develop appropriately scaled wastewater treatment systems in coastal areas with planned growth</li> <li>• Enforcement of storm-water discharges</li> </ul>

**Table 4-3: Federal Agencies involved in ocean resource and coastal zone management**

Federal Agency	Responsibilities for Ocean Resource and Coastal Zone Management
Office of The White House	<ul style="list-style-type: none"> <li>• National Ocean Council</li> <li>• National Ocean Policy</li> </ul>
Department of Homeland Security, U.S. Coast Guard	<ul style="list-style-type: none"> <li>• Lighthouses</li> <li>• Protection of US Exclusive Economic Zone from foreign encroachment (200 nautical miles from shore)</li> <li>• Enforcing domestic fisheries law</li> <li>• Works in collaboration with Fisheries Management Councils and NOAA Fisheries</li> <li>• Marine Protected Species, Endangered Species Act</li> </ul>
U.S. Department of Agriculture, Natural Resources Conservation Service	<ul style="list-style-type: none"> <li>• Conservation Innovation Grants</li> <li>• Conservation technical assistance</li> <li>• Healthy Forests Reserve Program</li> <li>• Healthy Watersheds Initiative</li> <li>• Watershed Protection and Flood Prevention Program</li> <li>• Agricultural Water Enhancement Program</li> <li>• Wetlands Reserve Program</li> <li>• Water management</li> </ul>

Federal Agency	Responsibilities for Ocean Resource and Coastal Zone Management
U.S. Department of Agriculture, Cooperative Extension Service	<ul style="list-style-type: none"> <li>• Partners with UH Cooperative Extension Service, College of Tropical Agriculture and Human Resources (UH CTAHR)</li> <li>• Soil Management Collaborative Research Support Program</li> <li>• Invasive species and pest control</li> <li>• Aquaculture</li> </ul>
U.S. Geological Survey, Department of the Interior	<ul style="list-style-type: none"> <li>• Historical streamflow data</li> <li>• Groundwater levels</li> <li>• Water quality data</li> <li>• Water use data</li> <li>• National Climate Change and Wildlife Science Center</li> </ul>
U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Ocean Service	<ul style="list-style-type: none"> <li>• Ocean partnerships</li> <li>• Coastal marine spatial planning funding</li> <li>• National Marine Sanctuaries</li> </ul>
NOAA Ocean & Coastal Resource Management	<ul style="list-style-type: none"> <li>• Coastal Zone Management</li> <li>• National Estuarine Research Reserve System (NERRS)</li> <li>• Coastal and Estuarine Land Conservation Program</li> <li>• National Marine Protected Areas Center</li> <li>• Coastal Nonpoint Pollution Control Program</li> <li>• Ocean Thermal Energy Conversion</li> </ul>
NOAA Coral Reef Conservation Program	<ul style="list-style-type: none"> <li>• Preservation and sustainability of coral reefs</li> <li>• Partnerships with NOAA Line Offices to work on coral reef issues</li> </ul>
NOAA Marine Debris Program	<ul style="list-style-type: none"> <li>• Marine debris</li> <li>• Japan Tsunami Marine Debris</li> </ul>
NOAA National Marine Fisheries Service	<ul style="list-style-type: none"> <li>• Aquaculture</li> <li>• Habitat conservation</li> <li>• Protected species (Hawaiian Monk Seal, Green Sea Turtle)</li> <li>• Seafood inspection</li> <li>• Marine aquaculture</li> <li>• Sustainable fisheries</li> <li>• Regulation of fisheries in federal waters</li> <li>• Pacific islands regional connections</li> </ul>
U.S. Department of Agriculture U.S. Forest Service	<ul style="list-style-type: none"> <li>• Healthy Forest Initiative</li> <li>• Wildland Fire Management</li> </ul>
Department of the Interior, U.S. Fish & Wildlife Service	<ul style="list-style-type: none"> <li>• Critical habitats</li> <li>• Endangered species</li> <li>• Wildlife refuges</li> <li>• Invasive species</li> </ul>

## ORMP Policy Group and Working Group

The ORMP Working Group and Policy Group have become major coordination bodies for the different interagency collaboration needed to manage ocean resources. Both groups were formed in July of 2007, after the 2006 ORMP was completed. The Policy Group meets twice a year, and its 20 members consists of the directors of state and county resource management agencies, the University of Hawai‘i, federal partners, and the Marine and Coastal Zone Advocacy Council. The Working Group meets monthly and consists of managers and staff of the same offices that are tasked with coordinating their respective agency’s implementation efforts.

**Figure 4-1: Office of Planning Director Addresses ORMP Policy Group, June 2012**



Additional people are invited to the ORMP Working Group meetings from various divisions within state agencies as well as resource people from federal agencies, environmental non-profit groups that have worked on ORMP Demonstration Projects, and the University of Hawai‘i.

**Figure 4-2: ORMP Working Group Discussion, July 2012**



The full list of agencies and groups represented and participating in the ORMP to date are:

**Federal Partners** include NOAA Office of National Marine Sanctuaries, Pacific Islands Region (ONMS); NOAA Office of Ocean & Coastal Resource Management (OCRM); NOAA Pacific Services Center (PSC); United States Army Corps of Engineers (USACE); United States Coast Guard (USCG); and United States Environmental Protection Agency (EPA).

**State Partners** include State of Hawai'i Departments of Agriculture (DOA), Civil Defense (SCD), Health (DOH), Land & Natural Resources (DLNR), Transportation (DOT), and Office of Hawaiian Affairs (OHA).

**University Partners** include University of Hawai'i, School of Ocean & Earth Science & Technology (SOEST); University of Hawai'i, Sea Grant College Program (UH Sea Grant); University of Hawai'i, Center for Island Climate Adaptation & Policy (ICAP); and Pacific Islands Ocean Observing System (PacIOOS).

**County Partners** include City and County of Honolulu, Department of Planning and Permitting; County of Hawai'i, Planning Department; County of Kaua'i, Department of Planning; County of Maui, Department of Planning; and Honolulu Board of Water Supply (BWS).

**Community Partners** include the Marine & Coastal Zone Advocacy Council (MACZAC).

## Scientific and Ocean Research Activities Taking Place in Hawai'i

The University of Hawai'i is currently involved with scientific and research activities in a number of fields.

- SOEST at UH Mānoa is one of the nation's premier academic institutions for ocean-related research. SOEST faculty and staff conduct research in a broad disciplinary range, including:
  - The Hawai'i Institute of Marine Biology (HIMB) situated on Coconut Island in Kāne'ohe Bay
  - Hawai'i Undersea Research Laboratory, established by NOAA and UH to study deep water marine processes in the Pacific Ocean.
  - International Pacific Research Center, conceived under US-Japan Common Agenda for Cooperation in Global Perspective focuses on understanding climate variation and predictability in the Asia-Pacific region, including regional aspects of global environmental change. The Asia-Pacific Data Research Center provides easy access to climate data and research products. Specific projects include oceanic modeling, Hawai'i Regional Forecast, monsoon monitoring, precipitation prediction, and other research.
  - Joint Institute for Marine and Atmospheric Research was established to pursue the common research interest of NOAA and the UH in oceanic, atmospheric, and geophysical research, including climate and global change, equatorial oceanography, tsunamis and fishers oceanography.
  - Center for Microbial Oceanography: Research and Education facilitates a greater understanding of microorganisms in the sea, ranging from the genetic basis of marine microbial life to their ecological place in the marine environment.
- **Pacific Islands Ocean Observing System (PacIOOS)** is based within SOEST and is the Pacific Islands regional component of the US Integrated Ocean Observing System (IOOS®). PacIOOS is a partnership of data providers and users working together to enhance ocean observations and develop, disseminate, evaluate, and apply ocean data and information products designed to

address the environmental, economic and public safety needs of stakeholders who call the Pacific Islands home. The organization's major goal is to make data understandable and useable for researchers, resource managers, and the public. Within Hawai'i, PacIOOS research and development includes:

- A system of models that assimilate direct observations in order to produce a comprehensive ocean state prediction for the main Hawaiian Islands:
  - **Circulation Models:** Ocean circulation and current forecasts are made daily using the Regional Ocean Modeling System (ROMS) for the Main Hawaiian Islands, with increased resolution for O'ahu.
  - **Wave Modeling:** Ocean waves are forecast daily using WaveWatch III (WWIII) and Simulating Waves Nearshore (SWAN) models with domains that extend throughout the entire Pacific with increasing resolution for each of the main Hawaiian Islands and the Mariana Islands.
  - **Atmospheric Modeling:** The Weather Research and Forecasting (WRF) model produces daily atmospheric forecasts covering all of the Hawaiian Islands as well as detailed forecasts for each of the main Hawaiian Islands.
- A sensor network measuring water quality (conductivity/salinity, temperature, pressure, chlorophyll, turbidity and in some locations, also pH, dissolved oxygen and CO<sub>2</sub>)
- An array of wave buoys, measuring height, direction and period throughout Hawai'i :
- An array of sensors conducting biological monitoring (satellite tags and passive and acoustic instrumentation) to track the behavior, movement and population dynamics of marine mammals, reef fish, and pelagics such as sharks and tuna.
- An array of High Frequency Radio systems to monitor surface currents real-time along the south shore of O'ahu. Expanding to include the Leeward Coast of O'ahu and Hilo on Hawai'i Island as well.
- Operational products that forecast wave inundation, high sea levels, coastal erosion, nearshore wave and current hazards, and impacts of sea-level rise in low-lying communities.
- Integration projects that present data and information collected through the system above into user-friendly tools and services:
  - PacIOOS Website ([www.pacioos.org](http://www.pacioos.org)) includes data servers where users can access and download data for free and store data long term. Real-life applications include dynamic mapping of endangered species, such as the Hawaiian monk seal
  - PacIOOS Voyager is an interactive online mapping platform that uses Google Maps as a foundation for data overlays. Data are incorporated directly from PacIOOS servers as well as from other data providers. Historical, current, and forecast data are available, as are dynamic and static data layers. Users can access Voyager for free to visualize, save, embed, download, and combine thousands of data layers in an easy-to-use platform.
  - PacIOOS Explorer is a free data service providing GIS or map-based information to the insular Pacific. This web mapping service (WMS) and geospatial database is a unique service of PacIOOS and acts to fulfill a more robust demand for geospatial cataloging, computations, and analysis. The WMS allows users to directly query the database, then make, save, and print maps and overlays as well as conduct geospatial analyses.

**University of Hawai'i Sea Grant** College Program works in collaboration with SOEST and the National Oceanic and Atmospheric Administration (NOAA). Sea Grant is dedicated to improving the understanding and stewardship of marine and coastal resources in the state and region. UH Sea Grant includes centers for Sustainable Aquaculture, Marine Science Education, and Island Climate Adaptation and Policy. Recent publications include "Research Priorities in the Insular Pacific: Transforming Research into Regional Management."

UH Sea Grant is hosting the NOAA Coastal Storms Program to foster community resilience to coastal hazards that focuses on funds and resources in the US Pacific Island coastal communities to help reduce and mitigate the risk from coastal storm and weather hazards and climate change. The program provides an array of tools, products and services, including improved observing systems, forecast models, decision support tools, assessments, community best practices and guidance, socioeconomic information, training and outreach/extension activities to enhance community resilience.

Specific programs include

- Coastal inundation mapping, including storm surge and hurricane inundation mapping
- Developing Pacific storms climatology, Pacific Climate Information system (PaCIS), Climate Extremes in the Pacific Integrated Case Studies (EPICS) to support vulnerability assessment and adaptation planning
- Developing a Pacific Region GPS Met Network
- Improving the national spatial reference system in the Pacific Islands
- Assessing land-based toxic runoff and coral reef ecosystem resilience in the Pacific Islands

The Pacific Regional Integrated Sciences and Assessments (Pacific RISA) program supports Pacific island and coastal communities to mitigate and adapt to the impacts of climate variability and change. The agency conducts research in water resources, management, coastal impacts and disaster risk management.

The Pacific Islands Regional Climate Assessment (PIRCA) is a collaborative effort aimed at assessing the state of climate knowledge, impacts and adaptive capacity in Hawai'i and the US affiliated Pacific Islands. PIRCA provides information to federal, state and local government agencies, non-governmental agencies, businesses, and community groups, with priority focus on preserving freshwater resources and minimizing the impacts of drought, fostering community resilience to the impacts of sea-level rise, coastal inundation and extreme weather, and sustaining marine, freshwater, and terrestrial ecosystems. Research topics involve:

- Climate variability and change science, including historical observations, trends, and climatology,
- Freshwater resource sustainability, flow trends, groundwater recharge, demographic stresses
- Sea level rise and coastal inundation projections and scenarios, current and projected coastal hazards and impacts,
- Ecosystem assessments including climate effects on ocean acidification and coral health, SLR impacts on ecosystems, saltwater intrusion, and species/habitat responses to precipitation and temperature changes.

The University of Hawai'i has recently committed to a collaborative Sustainability Initiative for the campus, involving new staff clustered around the statewide program. UH Sea Grant competed with other departments across the University of Hawai'i system and won funding for this important and groundbreaking initiative. The cluster includes five new tenured staff in the fields and schools of economy, engineering, oceanography, architecture, planning, Hawaiian Studies, and ocean agriculture. The program will be focused on the three areas of water, energy and transportation, and while each staff member is housed in one of the five schools, they are also required to dedicate 25% of their time to collaborative work in the Sustainability Initiative, in separate offices housed at UH Sea Grant.

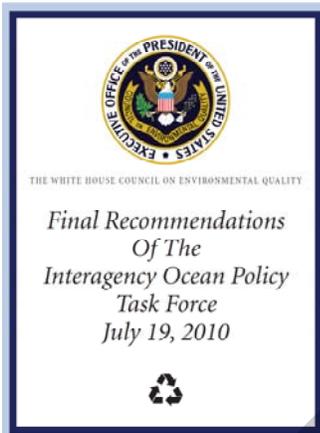
## National Ocean Policy

President Barack Obama signed Executive Order 12547 on July 19, 2010, otherwise known as the National Ocean Policy. This groundbreaking policy provides the framework for federal agencies to work together to pursue the National Ocean Policy’s Vision while engaging the states, native people, local authorities, regional governance structures, non-governmental organizations, the public, and the private sector. Such a broad framework and collaboration has never been done before in relation to ocean resources management.

The Interagency Ocean Policy Task Force (IOPTF) was established on June 12, 2009, and it is composed of 24 senior-level officials from executive departments, agencies, and offices across the federal government. The IOPTF is led by the Chair of the Council on Environmental Quality (CEQ). The mission of the IOPTF is to develop recommendations to enhance the country’s ability to maintain healthy, resilient, and sustainable ocean, coasts, and Great Lakes resources for the benefit of present and future generations.

### National Ocean Policy Vision

“To achieve an American whose stewardship ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations.”



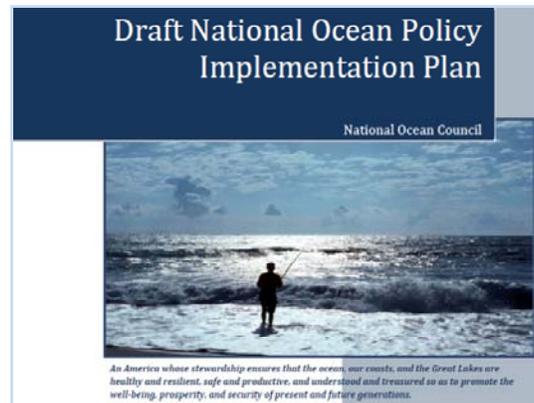
The *Final Recommendations of the Interagency Ocean Policy Task Force* were completed on July 19, 2011 and published in the Federal Register. The recommended implementation strategy identified nine categories for action. These nine categories for action were titled, “National Priority Objectives,” and are shown in Table 4-4 on the following page.

The *Final Recommendations of the Interagency Ocean Policy Task Force* sets forth a framework under which the United States will be subdivided into nine regional planning areas: Northeast, Mid-Atlantic, South Atlantic, Great Lakes, Caribbean, Gulf of Mexico, West Coast, Pacific Islands, and Alaska/Arctic region. These are referred to as Regional Planning Bodies. Since that time, Hawai‘i, American Samoa, Guam, and the Commonwealth of the Northern Marianas Islands

have formed the Pacific Regional Ocean Partnership (PROP), which is discussed later in this chapter.

The Interagency Ocean Policy Task Force also recommended the development of regional ocean governance bodies to help state and federal agencies jointly address ocean and coastal challenges. The Hawai‘i Sub-Regional Ocean Partnership (Hawai‘i Sub-ROP) encompasses all islands in the Hawaiian chain and is discussed later in this chapter.

The National Ocean Council is a dual Principal and Deputy level committee. The National Ocean Council has primary responsibility for implementation of the National Ocean Policy.



The Regional Planning Bodies (RPBs) membership consists of authorities relevant to Coastal Marine Spatial Planning for that area. Hawai‘i has two representatives to the Pacific RPB: Office of Planning and DLNR.

Table 4-4: National Priority Objectives

### National Priority Objectives

1. **Ecosystem-Based Management:** Adopt ecosystem-based management as a foundational principle for the comprehensive management of the ocean, our coasts, and the Great Lakes.
2. **Coastal and Marine Spatial Planning:** Implement comprehensive, integrated, ecosystem-based coastal and marine spatial planning and management in the United States.
3. **Inform Decisions and Improve Understanding:** Increase knowledge to continually inform and improve management and policy decisions and the capacity to respond to change and challenges. Better educate the public through formal and informal programs about the ocean, our coasts, and the Great Lakes.
4. **Coordinate and Support:** Better coordinate and support Federal, State, tribal, local, and regional management of the ocean, our coasts, and the Great Lakes. Improve coordination and integration across the Federal Government, and as appropriate, engage with the international community.
5. **Resiliency and Adaptation to Climate Change and Ocean Acidification:** Strengthen resiliency of coastal communities and marine and Great Lakes environments and their abilities to adapt to climate change impacts and ocean acidification.
6. **Regional Ecosystem Protection and Restoration:** Establish and implement an integrated ecosystem protection and restoration strategy that is science-based and aligns conservation and restoration goals at the Federal, State, tribal, local, and regional levels.
7. **Water Quality and Sustainable Practices on Land:** Enhance water quality in the ocean, along our coasts, and in the Great Lakes by promoting and implementing sustainable practices on land.
8. **Changing Conditions in the Arctic:** Address environmental stewardship needs in the Arctic Ocean and adjacent coastal areas in the face of climate-induced and other environmental changes.
9. **Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure:** Strengthen and integrate Federal and non-Federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system, and integrate that system into international observation efforts.

**National Priority Objectives**

The nine National Priority Objectives align well with the 2006 ORMP Perspectives, Management Goals, and Strategic Actions. Table 4-5 below shows each of the National Priority Objectives and then groups them by the Three ORMP Perspectives.

**Table 4-5: National Priority Objectives and ORMP Goals**

National Priority Objective	ORMP Goal
1. Ecosystem-Based Management 6. Regional Ecosystem Protection and Restoration	Perspective 1: Connecting Land and Sea <ul style="list-style-type: none"> <li>• ORMP adopts place-based as a foundational principal, which applies to nearshore fisheries, coral reefs, sea grasses, and other resources.</li> <li>• This goal addresses soil erosion and pollutant loads.</li> </ul>
7. Water Quality and Sustainable Practices on Land 8. Changing Conditions in the Arctic	Perspective 2: Preserving Our Ocean Heritage
2. Coastal and Marine Spatial Planning 3. Inform Decisions and Improve Understanding 4. Coordinate and Support 5. Resiliency and Adaptation to Climate Change and Ocean Acidification 9. Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure	Perspective 3: Promoting Collaborative Governance and Stewardship <ul style="list-style-type: none"> <li>• ORMP aims to build capacity for community participation in resource management through education and outreach</li> <li>• Updated ORMP includes PROP and Hawai'i Sub-ROP</li> <li>• Climate change adaptation is included</li> </ul>

Actions under National Priority Objective #8 Changing Conditions in the Arctic are geographic specific. However, changing conditions in the Arctic are linked to climate change and the warming of the oceans, which in turn can contribute to ocean acidification, coral bleaching, and the degradation and habitat loss of entire reefs. The changing conditions in the Arctic are being monitored by the U.S. Integrated Ocean Observing System (IOOS) and continued collaboration with PacIOOS.

For this ORMP Update, several emerging ocean resources management issues were added to the goals, objectives and strategic actions of the ORMP. These emerging issues address several National Priority Objectives such as #2 Coastal and Marine Spatial Planning, #5 Resiliency and Adaptation to Climate Change and Ocean Acidification, #8 Changing Conditions in the Arctic, and #9 Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure.

**Pacific Regional Ocean Partnership (PROP)**

The Pacific Regional Ocean Partnership is a voluntary partnership between the Governors of the U.S. Pacific Islands Region, and consists of the State of Hawai'i, the Commonwealth of the Northern Mariana Islands (CNMI), and the Territories of Guam and American Samoa. Unlike most of the other regional ocean partnerships, this region does not share physical boundaries.

The Pacific Regional Ocean Partnership (PROP) has been formed, and this partnership will help to implement the National Ocean Policy, using the *Draft National Ocean Policy Implementation Plan* as a resource for action, being mindful of the traditional gathering rights, cultural sensitivities, and unique

geographic considerations. The National Ocean Council's *Draft National Ocean Policy Implementation Plan* (January 2012) is guided by four themes: 1) adopt ecosystem-based management; 2) obtain, use, and share the best science and data; (3) promote efficiency and collaboration; and 4) strengthen regional efforts.

The University of Hawai'i Social Science Research Institute was awarded a grant in January 2012 to serve as the Principle Investigator and cover administrative expenses to support the development of the PROP.

A Governor's Agreement to formalize the working relationships between the four jurisdictions in the PROP was signed on August 22, 2012. The mission of the PROP is to assist the four jurisdictions to

identify coastal and ocean management priorities that require a coordinated regional response and increased collaboration to effectively address these issues. The actions of the PROP will complement, and take advantage of, other ongoing regional efforts while respecting individual state policy making requirements. While just formed in the summer of 2012, the structure will include an Executive Group, a Steering Group, Action Coordination Teams, and Supporting Partners.

**View the Signed PROP Agreement here:**  
[http://manage.hawaii.gov/gov/newsroom/press-releases/PROP\\_signed\\_082212.pdf](http://manage.hawaii.gov/gov/newsroom/press-releases/PROP_signed_082212.pdf)

### **Hawai'i Sub-Regional Ocean Partnership (Hawai'i Sub-ROP)**

The Office of Planning, representing Hawaii's ORMP partners, was awarded \$250,000 through the NOAA Regional Ocean Partnership Funding Program in January 2012. This funding is to facilitate stakeholder engagement and foster the development of the Hawai'i Sub-Regional Ocean Partnership (Hawai'i Sub-ROP). The Hawai'i Sub-ROP encompasses the main Hawaiian islands as well as the Northwestern Hawaiian Islands, a span of 1,523 miles. This area includes the 12 nautical mile Territorial Sea and the 200 nautical mile Exclusive Economic Zone.

The ocean area covered by the Hawai'i Sub-ROP is co-managed by the State of Hawai'i Department of Land and Natural Resources (DLNR) and the Federal Government. The State of Hawai'i waters are defined as any shores or water between the three nautical mile limit and the mean high tide mark on the shores of the islands of the State of Hawai'i, and enforcement in this area is the responsibility of the DLNR Division of Conservation and Resources Enforcement. Federal waters under the jurisdiction of the United States are patrolled by the U.S. Coast Guard up to the U.S. Economic Exclusion Zone, which is any water within 200 nautical miles of shore. The Northwestern Hawaiian Islands are within the Papahānaumokuākea Marine National Monument, which is co-managed by NOAA, the U.S. Fish and Wildlife Service, and the State of Hawai'i DLNR. The Hawaiian Islands Humpback Whale National Marine Sanctuary, which includes the waters between Maui, Moloka'i, and Lāna'i, the north shore of Kaua'i, and the north and southeast shores of O'ahu, is co-managed by NOAA and State of Hawai'i DLNR.

The Hawai'i Sub-ROP is meant to ensure meaningful engagement and coordination of partners and the public through natural and cultural resource management processes in Hawai'i, with the goals and objectives of the ORMP forming the basis. It will also ensure consistency with federal objectives.

While many engaged stakeholders and informal partnerships have formed as a result of implementing the ORMP, a major objective of the Hawai'i Sub-ROP is to formalize these partnerships. ORMP stakeholders who manage and protect Hawai'i's coastal and ocean resources are members of the ORMP Policy and Working Groups. Additional stakeholder groups such as coastal communities, recreational users, Native Hawaiian cultural practitioners, tourists, commercial interests, families and individuals will also have opportunities to participate in the Sub-Regional Ocean Partnership for Hawai'i.

## Coastal and Marine Spatial Planning

Coastal and marine spatial planning (CMSP) is one of the National Priority Objectives and is seen as an important tool for implementing the National Ocean Policy. CMSP for the Pacific Islands Region is expected to help form policies, identify best management practices (BMPs) and aid in the preparation of rules and regulations that are based on scientific data on sea level rise, storm surge, ocean acidification, and other climate variables.

In Hawai‘i, CMSP is seen as important information sharing tool as part of collaborative management. CMSP would be built on the extensive and widely used Geographical Information System (GIS). The Office of Planning houses the metadata for GIS for the State of Hawai‘i, and adding the metadata for the state’s coastlines and up to 3 miles out into the ocean is a natural expansion of its GIS capabilities. The CMSP would be a robust online information management system that allows easy access to and transparency of data and information necessary for planning, and mechanisms for frequent stakeholder and public input.

CMSP would be a useful public policy tool which maps a variety of things relating to ocean resources. CMSP would be adaptive, integrated, ecosystem-based, and a transparent spatial planning process, based on science, for analyzing current and anticipated uses of the ocean and coastal resources. As a planning tool, it can be used to look across multiple sectors and jurisdictions. Examples might include enhancing public beach access; improving ocean user compatibility and reducing user conflicts; reducing environmental impacts to the ocean; supporting sustainable, safe, secure, efficient and productive uses of the ocean; and enhancing collaboration. An example of CMSP is the data system developed by the State of Oregon called MarineMap.

The first step is to set up the collaborative Coastal Marine Spatial Planning Process, which includes stakeholder engagement in order to incorporate appropriate GIS layers into the tool. The second step would be to build the GIS tool, which is shown below as the spatial management plan. An example of GIS layers could be a biology layer with data on birds, fish, marine mammals, and plants or a marine renewable energy layer.

## Traditional Resource Management Concepts

Natural resources were managed traditionally in Hawai‘i using *kuleana* (responsibility) principles, assigned at the *ahupua‘a* and *moku* levels. An *ahupua‘a* is a unit of land, which contains a self-sufficient amount of natural resources necessary for all of its tenants to survive and thrive. Literally translated, an *ahu* is a cairn or man-made pile of stones. A *pua‘a* is a pig. Native Hawaiians used the *ahu* with the symbol of a *pua‘a* on top to mark these land divisions, which normally follow existing contours of land and begin in the mountains “*mauka*” and end in the ocean “*makai*.” Several *ahupua‘a* adjoining one another were delineated as a *moku*. Like the *ahupua‘a*, the *moku* varied in size.

‘Aha Councils, which were composed of a diverse group of practitioners and acknowledged experts in agriculture, fishing, water resources, and cultural skills, lived within each *ahupua‘a* and served together as the governing board. The *kapu* system governed codes of conduct, social rules, and resource management, making certain actions *kapu* or forbidden. Hawaiian fishing was regulated through this *kapu* system in order to maintain its long-term viability. Certain fish were *kapu* during times of spawning or low fish counts. Designated fishing areas were also *kapu* during certain times when overfishing could damage the eco-system. A *konohiki*, or manager, would be the enforcer of the *kapu* system. The ‘Aha Moku System is discussed later in this chapter in the Place-Based Management section.

## Marine Management Areas

Since Statehood in 1959, the Hawai‘i State government has assumed most of the functions once performed by the *konohiki*. There are seven types of Marine Managed Areas (MMAs) that are the responsibility of the State Department of Land and Natural Resources:

- 1) Marine Life Conservation Districts
- 2) Fishery Management Areas
- 3) Fishery Replenishment Areas
- 4) Bottomfish Restricted Fishing Areas
- 5) Wildlife Sanctuaries/Research Refuges
- 6) Natural Area Reserves
- 7) Hawaiian Islands Humpback Whale National Marine Sanctuary (co-managed with federal government)

A map of these Marine Managed Areas from the DLNR website is shown as Figure 4-3 on the following page.

### Marine Life Conservation Districts

Marine Life Conservation Districts (MLCD) are designed to conserve and replenish marine resources, with limited fishing and other consumptive uses. This gives a protected area for fish and other aquatic life to grow and reproduce. The first MLCD designated in the State was Hanauma Bay in East O‘ahu, and there are 11 MLCD throughout the State.

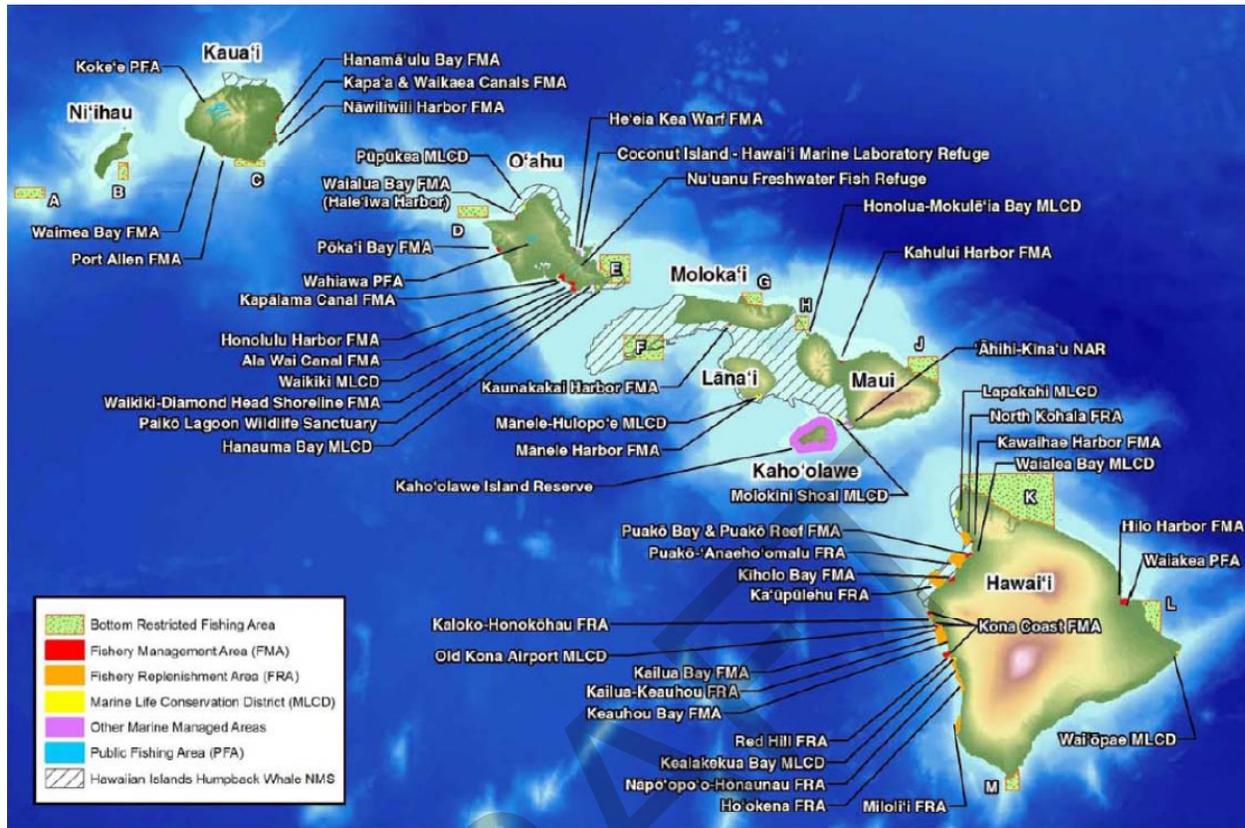
### Fishery Management Areas

There are 20 Fishery Management Areas (FMAs) on the islands of Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i and an additional nine FMAs in West Hawai‘i. Each FMA has different permitted and prohibited activities with different “takes” and different fishing methodologies.

The West Hawai‘i Regional Fisheries Management Area (WHRFA) includes nine individual FMAs. All types of fishing are permitted except for those on a “no take” list and by unregistered aquarium collecting vessels. During the fall of 2012, the no take list is being updated through Hawai‘i Administrative Rules and public hearings.

MLCD in Hawai‘i	
<u>O‘ahu</u>	
Hanauma Bay	
Pupukea	
Waikīkī	
<u>Hawai‘i Island</u>	
Kealakekua Bay	
Lapakahi	
Old Kona Airport	
Waialea Bay	
Waiopae Tidepools	
<u>Maui County</u>	
Honolua-Mokule‘ia Bay	
Manele Hulopo‘e	
Molokini Shoal	
<i>Source: DLNR-DAR</i>	

Figure 4-3: Marine Managed Areas in the State of Hawai‘i



Source: <http://hawaii.gov/dlnr/dar/images/MPAmap1g2.jpg>

### Bottomfish Restricted Fishing Areas

Bottomfish Restricted Fishing Areas are defined by latitude and longitudes and are provided in 12 places throughout the state. There are seven fish covered, otherwise referred to as the “Deep 7,” and these include onaga, ehi, kalekale, ‘ōpakapaka, ukikiki, hapu‘u, and lehi. There are seasons for fishing, gear restrictions, commercial fisher reporting, minimum size and bag limits.

### Wildlife Sanctuaries/Research Refuges

The Coconut Island Hawai‘i Marine Laboratory Refuge in Kāne‘ohe Bay and the Paiko Lagoon Wildlife Sanctuary in East Honolulu are both off the island of O‘ahu. The University of Hawai‘i uses the Hawai‘i Marine laboratory Refuge for scientific studies, and it is illegal for anyone else to take any aquatic life from within the boundaries of the refuge. The Paiko Lagoon Wildlife Sanctuary does not allow taking of any aquatic life.

### Natural Area Reserves for Oceans

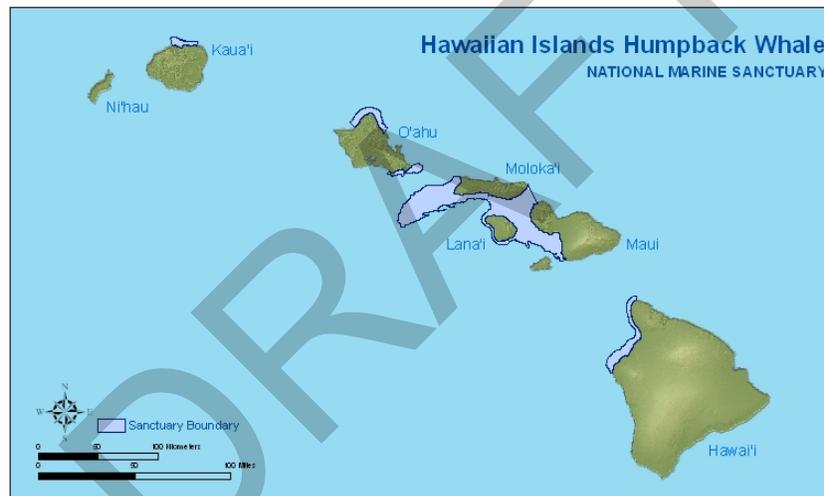
The Kaho‘olawe Island Reserve is managed by the Kaho‘olawe Island Reserve Commission (KIRC), which was placed within DLNR for administrative purposes. This includes the island of Kaho‘olawe and the marine waters two miles from shore. The KIRC is responsible for the restoration of Kaho‘olawe, which was transferred to the State of Hawai‘i by the U.S. Navy after its use as a bombing range. There are no residents on Kaho‘olawe, and anyone visiting the island must be cleared by the KIRC.

The ‘Ahihi-Kina‘u Natural Area Reserve (NAR) on the South shore of Maui is managed by DLNR Division of Forestry and Wildlife Natural Area Reserve System and was the first reserve in the State Natural Area Reserve System. This NAR is part of Makai Watch, which is a Community-Based Resource Management project. The Hawai‘i Wildlife Foundation has partnered with DLNR through the Makai Watch program to restore and sustain this resource. It includes a marine protected area, which is home to a rich coral reef ecosystem and many protected species. Portions of the ‘Ahihi-Kina‘u reserve are closed from August 1, 2012 to July 31, 2014. Access to the northern and most visited portions is allowed between 5:30 a.m. and 7:30 p.m. daily.

### Hawaiian Islands Humpback Whale National Marine Sanctuary

The Hawaiian Islands Humpback Whale National Marine Sanctuary (Sanctuary) is jointly managed in a cooperative partnership between NOAA and The State of Hawai‘i. The Sanctuary surrounds the waters around the island of Lāna‘i and parts of Moloka‘i, and Maui as one contiguous area. Non-contiguous areas include waters off the North Shore of Kaua‘i, the Southeast and North shores of O‘ahu, and the West shore of Hawai‘i Island. A map showing these areas follows as Figure 4-5. Through education, research, and resource protection, the Sanctuary strives to protect humpback whales and their habitat.

**Figure 4-4: Hawaiian Islands Humpback Whale National Marine Sanctuary Map**



Source: NOAA

### Papahānaumokuākea Marine National Monument and World Heritage Site

The Papahānaumokuākea Marine National Monument encompasses 138,797 square miles of the Pacific Ocean and includes both marine and terrestrial habitats of the Northwestern Hawaiian Islands. It is the single largest conservation area in the United States and just celebrated its 10<sup>th</sup> anniversary since its recognition as a nature preserve. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) recognized Papahānaumokuākea as a World Heritage Site in 2010.

Three principal entities are responsible to manage the lands and waters of the Monument: NOAA, U.S. Fish and Wildlife Service, and the State of Hawai‘i, and they are collectively referred to as the Co-trustees. The Co-Trustees are jointly developing a Monument Management Plan.

The monument also includes the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve established in 2001 and are managed by NOAA in consultation with the USFWS and the State of Hawai‘i. The healthiest and least disturbed coral reefs in U.S. waters are found in the Monument, and they provide vital habitat to a variety of federally protected species.

Numerous archaeological artifacts can be found on the islands of Nihoa and Mokumanamana, both of which are on the National and State Historical Register for Historic Places. At right is a photo from the Monument website, showing upright rock formations on the island of Mokumanamana.

**Figure 4-5: Papahānaumokuākea**



Source: [www.papahānaumokuākea.gov](http://www.papahānaumokuākea.gov)

## Place-Based Management

Place-Based Management refers to designating appropriate uses for a particular geographic area to reduce user conflicts and protect the area from some or all preventable harm. Place-based management of ocean areas can take many forms. As discussed earlier, Marine Managed Areas are one form of place-based management. There are also other forms of this type of resource management. This will take different forms on each island, and even in each community.

Place-based management aligns well with the NOP Objective #1, Ecosystem-Based Management (EBM) and is highly consistent with resource management concepts of the traditional Hawaiian *ahupua‘a* system.

## ‘Aha Moku Resource Management

Modern day application of *ahupua‘a* management is no longer strictly practiced, although there are attempts at restoring this practice in several locations. Act 288, Session Laws of Hawai‘i 2012, sets forth an ‘Aha Moku Advisory Committee within the Department of Land and Natural Resources. The ‘Aha Moku Advisory Committee will consist of eight members appointed by the governor and confirmed by the State Senate from a list of nominations submitted by the ‘Aha Moku Councils on each of the eight Main Hawaiian Islands. Ni‘ihau, Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Kaho‘olawe, Maui, and Hawai‘i Island are each represented by one committee member.

Act 288 states that the ‘Aha Moku Advisory Committee may provide advice to the chairperson of the Board of Land and Natural Resources on issues related to land and natural resources management such as:

- 1) Integration of indigenous resource management practices with western practices in each *moku*;
- 2) Identification of a comprehensive set of indigenous practices for natural resource management;
- 3) Foster understanding of native Hawaiian resource knowledge;
- 4) Sustain the State’s marine, land, cultural, agricultural, and natural resources;
- 5) Provide community education and foster cultural awareness on benefits of the ‘Aha Moku system
- 6) Foster protection and conservation of the State’s natural resources; and
- 7) Develop an administrative structure to oversee the ‘Aha Moku system.

Act 288 recognizes 43 *moku* around the state. Prior to the formation of the ‘Aha Moku Advisory Committee within DLNR, the ‘Aha Kiole Advisory Committee held several statewide meetings and submitted reports to the State Legislature on their findings on best practices and structure for the management of natural and cultural resources in Hawai‘i. The ‘Aha Kiole had one representative from

each of the eight Main Hawaiian Islands, but they are not necessarily the same eight people to be appointed by the Governor to the newly formed ‘Aha Moku Advisory Committee in DLNR.

During the Public Listening Sessions for this ORMP Update, community members gave input on what modern day *ahupua‘a* management means to them. An *ahupua‘a* encompasses a “slice” of land from the mountains to the sea, and the Native Hawaiian view is that the entire land division is integrated. People spoke of *kumuwai*, which means both the source of wealth as well as the source of a stream, and in this instance the source comes from the rain above to the tip of the mountain, traveling through the *ahupua‘a* as a stream to the ocean. There is a reverence and acknowledgement that all is connected and that it is a higher power’s will that brings all water from its starting point in the heavens above to the ocean that surrounds the islands. Managing an *ahupua‘a*, while similar to the term conservation, incorporates sustainability principles. The *lo‘i* that feeds poi to the people of an *ahupua‘a* also functions as a place where non-point source sedimentation occurs while also slowing down the flow of water so that it can recharge the water table below the soil.

Community members expressed a need to feed their community, especially the *kupuna* (elders) and *keiki* (children) who were unable to catch or grow food for themselves. They saw traditional *ahupua‘a* land management as a way to ensure food for now and sustain it for the future. A community working together can plant and maintain *lo‘i*, reconstruct their shoreline Native Hawaiian fishponds, gather their own *paa kai* (salt), and keep their stream inflows to ensure a recharging of water in the entire water cycle. Many felt that they could do this without waiting for government assistance and without a statewide plan to tell them how to manage their own land. Others were organized for their entire island’s natural resources, such as on Moloka‘i, and wanted the ‘Aha Moku system to be mandatory.

### Community Action and Citizen Stewardship: ORMP Implementation Projects

A primary mission of the Office of Planning, Hawai‘i Coastal Zone Management Program (OP-CZM) is to coordinate the implementation of the ORMP by promoting collaborative governance and stewardship. During the ORMP Demonstration Phase, several community groups were able to implement projects with the assistance of funds from OP- CZM. Six ORMP implementation projects were funded that involved state or county government partners working with a community-based organization partner. Six other community projects were funded through the leveraging of other funds. The twelve projects described provide important information and lessons from the ORMP Demonstration Phase.

#### **Māhuhua ‘Ai o Hoi (O‘ahu)**



The Hawai‘i Community Development Authority (HDCA) received \$96,395.00 of OP-CZM funds to support a project called Māhuhua ‘Ai o Hoi. The community partners involved in this project included Kāko‘o ‘Ōiwi and the Ko‘olaupoko Hawaiian Civic Club. The project site is on O‘ahu’s windward coast at the He‘eia wetlands (Hoi), which currently lay fallow and are covered with dense vegetation. Mangrove overgrowth that was hampering the flow of the He‘eia Stream was removed. In order to restore the He‘eia wetlands and reduce non-point source pollution at the shoreline, the partners are incorporating a traditional Hawaiian *ahupua‘a* concept of land management through the

interconnections of the He‘eia wetlands to the He‘eia shoreline. The *He‘eia Wetland Restoration Strategic Plan 2010-2015* outlines plans, partnerships, and actions to be undertaken in the next few years. The planning and training phase of the project embodies all three perspectives of the ORMP and serves as a model demonstration project.

**Honu‘apo Estuary (Hawai‘i Island)**



This project is a partnership between the County of Hawai‘i and the community group Ka ‘Ohana O Honu ‘apo. The partners are implementing the Coastal Nonpoint Pollution Control Program (CNPCP) Wetlands Management Measure for Restoration of Wetland and Riparian Areas in Wetlands. A Best Management Practice they are implementing is for restoration of a naturally occurring aquatic ecosystem. OP-CZM granted \$25,000 to the County of Hawai‘i, and the County invested over \$300,000 for this project in the County’s Honu‘apo Park.

**Hilo Bay Watershed Advisory Group Web Site Project (Hawai‘i Island)**

This project involves the design, development, implementation, and administration of a professional-quality interactive website for use by the wider community to address the Hilo Bay Watershed Advisory Group mission, which is to “bring the community together to understand and protect the ecology of the Hilo Bay Watershed.” OP-CZM awarded \$5,000 to this project, which is a partnership between the County of Hawai‘i Planning Department, Hilo Bay Watershed Advisory Group, and the Big Island Resource Conservation & Development Council.



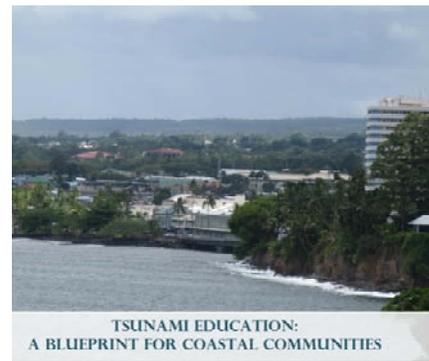
**Hilo Bay Watershed Advisory Group Water Quality Monitoring Program (Hawai‘i Island)**



This program identifies pollutants that may need application of Best Management Practices to bring suspect waters into compliance with current water quality standards. OP-CZM awarded \$5,020 to this project, which is a partnership between the County of Hawaii Planning Department, Hilo Bay Watershed Advisory Group, Big Island Resource Conservation & Development Council, DOH Clean Water Branch, and the Pacific Aquaculture & Coastal Resources Center.

**Tsunami Education, Preparation & Recovery Plan for Downtown Hilo (Hawai‘i Island)**

This project addresses the risk that the Downtown Hilo business community faces from tsunami inundation, including storm surge and coastal flooding. The lead partners for this project are County of Hawai‘i Planning Department and the Pacific Tsunami Museum. OP-CZM awarded \$24,700 to this project, which resulted in *Tsunami Education: A Blueprint for Coastal Communities* (January 2009).



### ***Baseline Monitoring at High-yield Watershed Units C and D (Hawai‘i Island)***

To prevent the degradation of streams and coastal waters from sediment loads carried from disturbed upland forest habitats, Best Management Practices will be followed by fencing Watershed Units C and D in the Pu‘u O Umi Natural Area Reserve and the Kohala Forest Reserve.

The Pu‘u O Umi Natural Reserve is 10,142 acres and was established in 1987. It includes 13 natural communities, including 2 rare communities. In addition, there are 124 total native plants and 7 total native animals, several of which are rare.

A six-acre ungulate-free unit has been constructed on and above the narrow windward sea cliffs.



The Kohala Forest Reserve is one of 22 reserves on the Island of Hawai‘i, and is adjacent to the Kohala Watershed and Pololu Valley. The lead partners for this project are the DLNR Division of Forestry & Wildlife and the Kohala Watershed Partnership. OP-CZM awarded \$50,000 for this effort.

### **Leveraged Projects**

The following projects occurred during the ORMP Demonstration Phase, and these were funded by one or more of the ORMP partners working in collaboration with the OP-CZM Program.

#### ***Mālama Maunalua at Maunalua Bay (O‘ahu)***



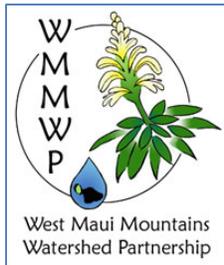
This ORMP Demonstration Project is titled, “E Mālama I Nā ‘Āina Kumu Wai O Maunalua: Caring for the watersheds of Maunalua.” The UH Sea Grant College Program and a community non-profit group, Mālama Maunalua, created a *Watershed Handbook for the Residents of Maunalua* to illustrate how low impact development and easy community tools can to reduce nonpoint source pollution. This project was funded under the Coastal Nonpoint Pollution Control Program (CNPCP) through OP and was written in cooperation with the UH Sea Grant College Program. This group has also partnered with schools and other volunteer groups to pull over 3 million pounds of invasive algae from Maunalua Bay, freeing up 23 acres of ocean. Mālama Maunalua has also worked with government agencies at the federal, state, and local levels to reduce runoff, while doing small community-based projects with residents and businesses to reduce the siltation into Maunalua Bay. This project is a prime example of building community capacity through education and outreach to address land-based pollution.

**Kawainui Marsh Levee Certification Project (O’ahu)**

The CZM Program completed a contract with the City and County of Honolulu to assist in the certification of the Kawainui Marsh Levee. The US Army Corps of Engineers had constructed the original Kawainui Flood Control Project in 1966, with modifications made in 1997. The project protects the town of Kailua against flood events while perpetuating the 830-acre Kawainui Marsh as the largest wetland in the State of Hawai‘i. In June 2012, DLNR and the USACE broke ground to construct the Kawainui Marsh Environmental Restoration Project.



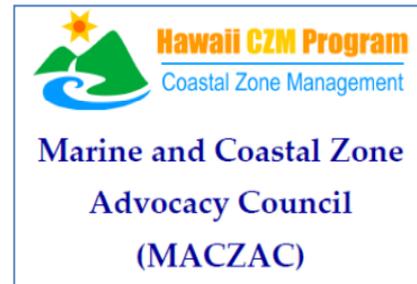
**West Maui Mountains Watershed Partnership (Maui)**



Several ORMP partners, including the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers (USACE), NOAA, Department of Health, and DLNR are developing a multi-purpose, multi-agency integrated plan to improve the overall water quality of the West Maui Watershed through the West Maui Mountains Watershed Partnership (WMMWP). The plan takes an *ahupua‘a* approach to the watershed, including the summit of Pu‘u Kukui to the outer reef while incorporating holistic management aspects of traditional Hawaiian land and natural resource management in a modern day context. WMMWP crews have installed fences to protect against Axis Deer in the watershed while also monitoring and controlling weeds. Since 1998, they have built 17 miles of fences to protect 17,989 acres of land.

**MACZAC ORMP Outreach (Statewide)**

MACZAC provides ORMP outreach throughout the state. MACZAC has reached out to community and user groups including the Ocean Tourism Coalition, Maui Visitor and Convention Bureau, and the Maui Hotel and Lodging Association.



**US Army Corps of Engineers (USACE) Silver Jackets Initiative (Statewide)**

Through its Silver Jackets Initiative, the USACE Honolulu District funded a collaborative project to reduce risk in the Pacific that could affect or impair holistic water management. The ORMP Policy and Working Groups were invited to partner with the USACE and the Pacific Risk Management Ohana (PRiMO) to support the continued development of synergies between agencies to help reduce risk



associated with an array of issues, including environmental degradation, natural disasters, and climate change. One of these projects was the *Hawai‘i 2060: Visioning Hawaii’s Adaptation to Climate Change* report.

## V. Phases, Orientations, and Priorities

### ORMP Phasing Approach

The 2006 ORMP charted a new course from previous plans by moving from a sector-based approach implemented by jurisdictional entities to a place-based approach implemented by a broad base of stakeholders. Experiences and lessons learned from each phase were to be documented and inform the next phase. All four phases work towards the long term goal of improving the condition of ocean resources and the coastal zone for future generations. The 2006 ORMP laid out four phases spanning 20 years, as shown in Figure 5-1, with expected outcomes of each phase defined through the year 2030.

Figure 5-1: ORMP Phases and Expected Outcomes



Source: Adapted from 2006 ORMP and Updated

### What Was Accomplished In The First Phase – The Demonstration Phase

The Demonstration Phase from 2006-2012 has ended, and much was learned during this initial phase of the ORMP. This section describes management goals and strategic actions completed and it is organized under the ORMP Three Perspectives to provide a framework for the actions taken. Working to achieve these three perspectives required collaboration among jurisdictional authorities as well as greater involvement by communities. Collaboration and cooperation is a main theme for the Demonstration Phase of the 2006 ORMP. Selected accomplishments from each perspective are discussed in following sections.

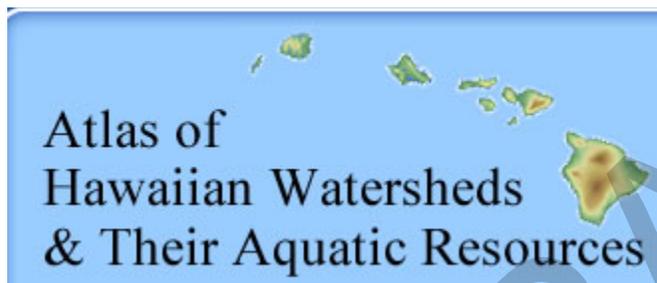
## Accomplishments Under Perspective 1: Connecting Land and Sea

### Watershed Atlas

The *Atlas of Hawaiian Watersheds & Their Aquatic Resources*, using a methodology similar to the *Hawai'i Watershed Management Plan*, defines over 500 watersheds in the State of Hawai'i. Data for 430 of these watersheds is included in the *Atlas*. The 4,500+ page *Atlas* is divided by the islands that have been mapped: Kaua'i, O'ahu, Moloka'i, Maui and Hawai'i. The *Atlas* was written in partnership with the DLNR Division of Aquatic Resources (DAR) and Bishop Museum and is linked to the DAR Aquatic Surveys Database so that it can be updated dynamically as new information becomes available.

**2006 ORMP Management Goals Addressed**  
*Management Goal 1.1 Improve coastal water quality by reducing land-based sources of pollution and restoring natural habitats.*

Strategic Actions that addressed this goal included: identification of priority watersheds, creation of a watershed guidance document, hosting a Watershed Summit, and improved interagency coordination.



The full *Atlas* may be viewed online. This reference is important because it lists land management status, areas of watersheds that are developed, percentages of various flora planted in that watershed, stream ratings, and specific scientific references for each unique area.

### 2009 Watershed Summit

The State of Hawai'i is required under the Federal Coastal Zone Management Act of 1990 to develop and submit to the Environmental Protection Agency (EPA) and National Oceanic and Atmosphere Administration (NOAA) a Coastal Nonpoint Pollution Control Program (CNPCP). At the State level, the Department of Health (DOH) and OP's CZM Program are responsible for developing the state's CNPCP. Hawai'i submitted its first CNPCP for Federal approval in 1996, covering 70 management measures and administrative elements. In 1998, the State received conditional approval of its program, subject to condition on 46 of the management measures and administrative elements that must be met for Hawai'i to receive final approval of its CNPCP.

**2006 ORMP Management Goals Addressed**  
*Management Goal 1.1 Improve coastal water quality by reducing land-based sources of pollution and restoring natural habitats.*

*Management Goal 2.2: Improve the health of coastal and ocean resources for sustainable traditional, subsistence, recreational, and commercial uses.*

Strategic Actions that addressed this goal included: identification of priority watersheds, creation of a watershed guidance document, hosting a Watershed Summit, identification of channelized streams, improvement of water quality monitoring, and improved interagency coordination.

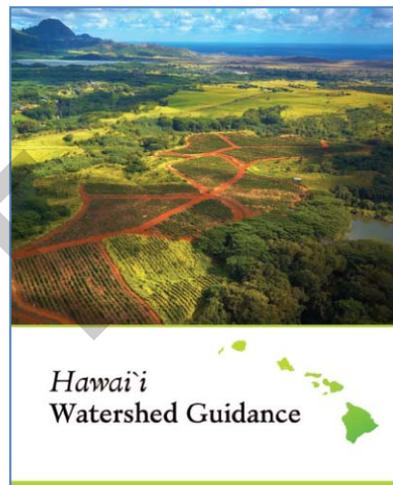
As of 2009, there were 14 management measures or administrative elements that have not received approval from EPA and NOAA. These include management measures for:

- Roads
- Highways

- Bridges
- Watershed Protection
- Hydromodifications (for example, impacts as a result of stream channelization)
- Protection of wetlands and riparian areas
- Multiple urban measures

In June 2009, the Office of Planning hosted a Watershed Summit to discuss the State of Hawaii's CNPCP. The workshop took each of the management measures that needed to be addressed and discussed them. From this workshop came the *Hawai'i Watershed Guidance* (August 2010). This guidance report is intended to help those who are involved in managing watersheds in the State.

Since the 2009 Watershed Summit and publication of the *Hawai'i Watershed Guidance*, OP and DOH have continued to work towards obtaining NOAA and EPA approval of the remaining 14 management measures. On March 27, 2012, NOAA and EPA approved management measures for Urban (Watershed Protection and Existing Development, Site Development); Hydromodifications; and Wetlands, Riparian Areas, and Vegetated Treatment Systems. The remaining management measures that require approval are: Urban (New Development, New and Operating Onsite Disposal Systems, and Roads, Highways and Bridges); and Monitoring and Tracking.



Many members of the ORMP Working Group participated in the Watershed Summit. The interagency and intergovernmental cooperation and collaborations were assisted by the partnerships and relationships that have been formed under the ORMP Working Group and Policy Group.

## Accomplishments Under Perspective 2: Preserving Our Ocean Heritage

### 2011 Climate Change Workshop

Climate change adaptation grew in attention and relevance during the Demonstration Phase. When the 2006 ORMP was written, climate change science was an emerging issue, just gaining international attention with many scientists gathering and aggregating data.

Climate change is important to Hawaii's coastal and ocean resources due to the potential for rising sea levels, increased storm surge, erosion of the shoreline, increased temperature of oceans, and increased salinity of oceans.

According to Dr. Chip Fletcher at the University of Hawai'i School of Ocean, Earth, and Science Technology (UH-SOEST), Hawaii's sea level is expected to rise approximately one foot by 2050 with an acceleration to three feet by 2100. Storm surges and their accompanying erosion are expected to increase up to 60% by the year 2100. And increase in salinity affects coral reefs, causing "coral bleaching."

**2006 ORMP Management Goals Addressed**  
*Management Goal 2.5 Encourage cutting edge and appropriate ocean science and technology with safeguards for ocean resource protection.*

This Management Goal included Strategic Actions to expand ocean science and technology as well as to conduct public education and outreach campaigns, which includes climate change.

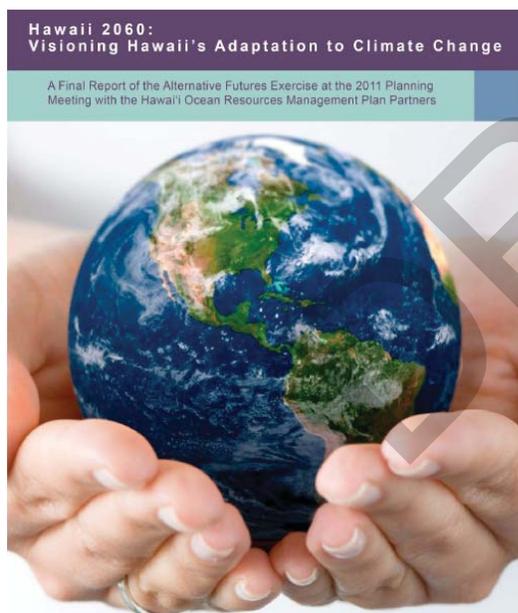
In August 2011, OP-CZM Program, in partnership with the U.S. Army Corps of Engineers (USACE), held a two-day workshop titled, “Visioning Hawaii’s Adaptation to Climate Change.” The list of participants included many of the ORMP Policy Group and Working Group members as well as other partners. The workshop was facilitated and recorded by Jim Dator, PhD, of the University of Hawaii’s Hawaii’i Research Center for Futures Studies and by Donna Ching, PhD, of the Department of Family and Consumer Sciences of the College of Tropical Agriculture and Human Resources.

The purpose of the workshop was to help identify which laws, plans, policies, and actions were needed to address potential impacts of climate change, including sea level rise. The workshop was divided into four groups, and each group discussed a futuristic scenario for the year 2060, framed by a set of questions to prompt discussion on climate change priorities and to deal with personal views of participants on climate change.

Participants identified two strategic issues with accompanying action plans:

- Strategic Issue #1: Educated Public and Political Will, with a goal to influence political will regarding climate change through educational efforts.
- Strategic Issue #2: Integrated Planning and Collaboration, with one goal to have better integration of planning among all agencies and another goal to create a better balance of the built and natural infrastructure to response to the effects of climate change.

The workshop results are documented in a report, *Hawaii’i 2060: Visioning Hawaii’s Adaptation to Climate Change*. As a follow up, a core group of participants volunteered to work with OP to draft climate change policy legislation that became part of the Governor’s 2012 Legislative Packet as SB 2745.



Prior to the 2012 Legislative Session’s opening day, the group worked to arrange a legislative informational briefing on climate change to address Strategic Issue #1.

The climate change adaptation bill, SB 2745, passed the 2012 Legislature and was signed by Governor Neil Abercrombie to become Act 286.

This was a management priority success. The program identified an issue, formed a partnership with a federal agency and various stakeholders, held a workshop, developed an approach, and then was able to affect change to public policy by getting the State Legislature to adopt a bill.

## Accomplishments Under Perspective 3: Promoting Collaboration and Stewardship

The interagency and intergovernmental collaboration achieved in the first five years not only represented a new approach to ocean resources management in Hawai'i, but it is a collaboration that has led to achievement of many of the management priorities and strategic actions and has helped to strengthen ongoing efforts to manage ocean resources.

### **2006 ORMP Management Goals Addressed**

*Management Goal 3.1 Apply integrated and place-based approaches to the management of natural and cultural resources.*

*Management Goal 3.2 Institutionalize integrated natural and cultural resources management.*

Strategic Actions included the development of integrated planning processes and legislative proposals to improve the management of natural resources as well as monitoring ORMP implementation.

### **Formation of the ORMP Policy Group and ORMP Working Group for Agency Coordination**

The OP-CZM Program formed the ORMP Policy Group and ORMP Working Group in 2007 just after completion of the *2006 ORMP*. The Policy Group consists of the Directors of state and county resource management agencies, the University of Hawai'i, federal partners, and the Marine Coastal Zone Advocacy Council. The Working group consists of managers and staff of the same offices that are tasked with coordinating their respective agency's implementation efforts.

Lessons learned during the Demonstration Phase were that the ORMP Policy and Working Groups are an integral part to implementation of the ORMP. The *2006 ORMP* had already been written at the time of the Working Group's formation, however, the group still needed to go through the process of finding the group's common goals and working styles in order to perform as a group.

The Policy Group meets approximately twice a year to sanction staff time and resources for the Working Group. The Working Group meets nearly every month. Agency status reports are given and special topical presentations are scheduled as needed. The Working Groups typically has a professional facilitator. Several of its monthly meetings in 2012 were dedicated to input and feedback on the ORMP Update.

There is a fairly frequent turnover of members in the Policy Group due to changeovers in administrations. Therefore, an orientation package was developed to assist members in their duties and roles. The Orientation Packet includes key reference materials:

- Background on the CZM Program;
- Summary of the National CZM Act of 1972;
- Summary of Hawaii's CZM law (Section 205A, HRS);
- Summary of the *2006 ORMP*;
- Listing of Federal, State, University, County, and community partners;
- Coordination/communication process outlining CZM Staff, Policy Group, and Working Group roles and responsibilities; and
- ORMP implementation projects.

### 2010 Joint ORMP Policy & Working Group Appreciative Inquiry Strategic Planning Session

At the February 2010 ORMP Policy Group meeting, Policy and Working Group members both requested that the Policy Group meet more frequently and increase their engagement with the Working Group. As a result, the OP-CZM Program developed a two-day strategic planning meeting for the Policy Group and the Working Group.

The Joint ORMP Policy & Working Group Appreciative Inquiry Strategic Planning Meeting was held at the Waikiki Beach Marriott in July 2010. A written record was kept of discussions at the meeting. A group memory was taken; aspirations or visions for the future and strategic issues were listed for each breakout group.

Visions for the future included more collaboration, education, and sustainability. Changes or transformations to the process that are necessary to achieve the vision include: education of participants, buy-in, and political will. Root causes of success include: communication, resources, and leadership. Core values included: Stewardship (malama), leadership, and unity expressed with harmony (lokaahi).

#### Mission Statement of the Policy and Working Groups

*“In support of a healthy and thriving ocean for today and future generations, we are committed to adopting integrated approaches to manage our ocean’s resources by: connecting land and sea; preserving our ocean heritage; and promoting collaboration and stewardship.”*

With a mission statement in place, the ORMP Groups brainstormed and prioritized their strengths, identified and prioritized opportunities, imagined a future to work toward, and developed action plans on how to achieve success. This exercise was called SOAR: Strengths, Opportunities, Aspirations and Results.

- Strengths included: partnerships and collaboration, resources, framework/plan itself, people capacity.
- Opportunities included: ocean planning and governance (opportunity for ORMP Policy Group) and purposeful collaboration (opportunity for ORMP Working Group).
- Aspirations included: All members of ORMP work together efficiently, the ORMP has become a living document, and adequate funding exists to implement the plan
- Results included: Action plans to achieve the vision, such as educating the next generation on the ocean through influencing change in standards-based curriculum and developing a Succession Strategy/Plan for the upcoming transition in membership within the ORMP Group.

### ORMP Consolidated Work Plan

The ORMP Working Group developed a two-year 2008 *ORMP Consolidated Work Plan*, which contained 137 activities related to the 2006 *ORMP* Three Perspectives. The Work Plan’s 137 activities were part of the 113 2006 *ORMP* strategic actions, which are in turn the implementation of each of the 2006 *ORMP* 10 Management Goals.

The 2008 *ORMP Consolidated Work Plan* recognized that not all of the 2006 *ORMP* management goals and strategic actions were being implemented in 2008. The 2008 *Work Plan* indicates that 69 out of the 113 *ORMP* strategic actions, or 61%, are currently in some stage of implementation by agency Working Group members. The 2008 *ORMP Consolidated Work Plan* provides a summary listing of the management goals and strategic actions being implemented through 2009 by the following agencies:

County Planning Departments (Hawai'i, Kaua'i, and Maui), Department of Agriculture (Aquaculture Development Program), Department of Health, Department of Land and Natural Resources, Department of Transportation (Harbors Division), Office of Planning, UH School of Ocean and Earth Science and Technology, and U.S. Coast Guard.

Since agencies could not be expected to implement all 113 actions all at once, Working Group members with responsibility to implement these actions went through the ORMP Strategic Action Matrix and identified which actions their respective agency were actively implementing or intending to implement between July 2007 to June 2009, which were deferred, and which should be dropped (or added). The intent was for the 2008 *ORMP Consolidated Work Plan* to be updated as needed.

Lessons learned from the 2008 *ORMP Consolidated Work Plan* were that it needed to be simplified, and the number of strategic actions reduced to a manageable and measurable number.

### **Accomplishments under the list of 28 Strategic Actions (from the 2006 ORMP)**

The 2006 *ORMP* contained 10 Management Goals and 28 Strategic Actions. Progress on these were reported in an interim year (2009) and in 2012 as a part of this evaluation and are described below. Even with the large amount of strategic actions, many of these were completed by 2009. A list of the 2006 *ORMP* actions underway in 2012 is included as Appendix B.

#### **For PERSPECTIVE ONE**

SA 1: Reduce soil erosion from upland forest ecosystems and conservation lands.

- In general, work on this strategy is on-going. Agencies have asked for the plan to provide more detail on types of preventive measures and BMP.

SA 2: Reduce pollutant loads from residential, agricultural, and commercial land uses in priority watersheds.

- PacIOOS operates near shore and some offshore water stations, expansion is underway.

SA 3: Restore and protect wetlands, streams and estuaries.

- The Coastal Non-Point Pollution Control Program has been approved (by NOAA and EPA) for 44 of 50 management areas, including all three for wetlands and riparian areas.
- Watershed Guidance document was prepared and a one-day Watershed Summit held. The Watershed Coordinating Committee was formed.
- Agency training was completed.

SA 4: Develop and implement a comprehensive and integrates shoreline plan for chronic and episodic coastal hazards.

- DLNR has a Coastal Erosion Management Plan and a Small Scale Beach Nourishment Program. But there still needs to be a consistent statewide policy on shoreline erosion, beach loss, and coastal hazards. There are complex jurisdictional issues, and the cost of solutions is high. There is inadequate interagency coordination and lack of problem recognition by the public. Also, DLNR has had staffing problems.
- County of Kaua'i Planning Commission is considering a shoreline setback bill which incorporates coastal erosion data.
- PacIOOS is developing management tools related to coastal hazards, specifically inundation.

- It is recommended that OP-CZM look at coastal hazards when reviewing EA/EISs for federal consistency.
- The Beach Vulnerability Rating Project (OCCL and SOEST) needs funding.
- CZM Program annually trains County Planning Commissioners and planning agency staff on CZM and SMA.
- UH Sea Grant conducts outreach and education and has positions funded on each island.

SA 5: Develop a Hawai‘i beach and shoreline management plan with specific management measures to address coastal erosion and other hazards in priority coastal areas.

SA 6: Encourage appropriate coastal dependent development that reduces risks from coastal hazards and protects coastal and cultural resources.

- Erosion based building setbacks are especially difficult in highly developed O‘ahu
- PacIOOS website contains tools for shoreline information and coastal hazards
- Work on a Guidance document on Cumulative and Secondary Impacts (CSI) for stormwater management is in progress (Phase III which is to refine the draft step by step methodology). This will be followed by training.

SA 7: Inspect and maintain sewer collection ecosystems including the detection of leaks.

SA 8: Reduce the number of individual wastewater systems and improve the operation of existing systems in the coastal environment.

SA 9: Reduce illegal stormwater discharges in the waste water system.

### **For PERSPECTIVE TWO**

SA 10: Minimize the introduction and spread of marine invasive species (AIS) into and throughout archipelagic waters.

- The AIS Team has been formed to respond to the spread of marine invasive species.

SA 11: Establish wastewater-discharge restricted zones and conditions for commercial vessels in archipelagic waters.

and

SA 12: Provide appropriate waste management infrastructure to support commercial and recreational marine facilities.

- Wastewater discharge restricted zones, and monitoring and enforcement plan is complete, as is temporary pump out facilities
- Annual user fee increased are in effect from 2010-2015.
- DOT Harbors is considering environmental criteria during harbor planning.

SA 13: Strengthen and expand marine protected area management.

and

SA 14: Develop ecosystem-based approaches for nearshore fisheries management.

- PacIOOS provides data and tools useful for EBM fishing management

SA 15: Establish and institutionalize approaches for restoring, operating, and preserving ancient Hawaiian coastal fishponds and salt ponds for the benefit of coastal communities around the State.

- OP, DOH and DLNR are working to streamline fishpond permitting process pursuant to 2012 Senate Resolution 86.
- OP will be submitting a CZM Program Consistency Statement to NOAA in fall 2012.
- A Draft Environmental Assessment (EA) and Programmatic Permit for fishpond restoration will be prepared in 2012-13.

SA 16: Improve enforcement capacity and voluntary compliance with existing rules and regulations for ocean resource protection.

SA 17: Enhance the conservation of Hawai‘i’s marine protected species, unique habitats and biological diversity.

SA 18: Enhance and restore existing public shoreline areas and scenic vistas.

- OCCL and the Counties (especially Kaua‘i) continue to be pressed by citizenry and the county has sought grants for coastal storm replenishment and beach nourishment for Poipu Beach and Kukui‘ula Harbor.
- Waikiki Beach sand restoration project is complete
- Interagency agreements for partnerships for Ka‘anapali and other Maui beaches are underway.
- Beach management plans for Kailua and Waikīkī are ongoing and need public and regulatory support to implement.
- *Watershed Guidance* document was prepared and training completed by CZM.
- Coastal land acquisition to preserve beaches in general has not started, although recommendations have been made for priority acquisitions when money is available.

SA 19: Establish new shoreline areas for public and appropriate coastal dependent uses.

- Beach inventories are taking place slowly as part of the County Development Plan process.
- Shoreline Assessment Model (OCCL) is complete, but the Beach Vulnerability Rating project has not started.
- Acquisition priorities have not been established, but public access areas are addressed at the subdivision and SMA level.
- County of Kaua‘i has a six phase shoreline bike path project that provides public access; two phases are already built.

SA 20: Develop community based frameworks and practices for identifying and mitigating ocean recreational use conflicts.

- DLNR study on “Recommended Strategies for Addressing Ocean Recreation User Conflicts” was completed in 2005. Next step is to address the four primary strategies recommended in the study.

SA 21: Promote responsible and sustainable ocean-based tourism.

SA 22: Promote alternative ocean energy sources.

SA 23: Plan and develop sustainable commercial aquaculture in coastal areas and ocean waters to diversify and expand Hawai‘i’s economy and provide locally produced sources of seafood.

- Responsibility has shifted to DOA (no longer DBEDT).
- NOAA Pacific Island Fisheries Science Center and PacIOOS are developing data layers and tools for aquaculture siting.

SA 24: Expand ocean science and technology.

**For PERSPECTIVE THREE:**

SA 25: Develop integrated natural and cultural resources planning process and standardized tools.  
and

SA 26: Build capacity for community participation in natural and cultural resources management.  
and

SA 27: Develop legislative and administrative proposals to improve management of natural resources.

- CZM Program funded a number of demonstration projects that were place-, cultural-, and/or community-based.
- CZM Program developed a Hawai‘i Community Stewardship Directory.
- A number of education and outreach activities were funded and supported.
- The ‘Aha Moku framework shifted to become an advisory council to the Director of DLNR.
- Permit streamlining focused on fishpond permits.
- Mauka-Makai Watch programs continue and are highly successful.

SA 28: Monitor and evaluate Ocean Resource Management Plan implementation.

- Policy Group and Working Group were established in 2007 and have met regularly since then.
- Consolidated Work Plan was prepared for 2007-09.
- Visioning Workshop was held in 2010.
- Five year update of the ORMP began in 2011-12.

## Approach for the Second Phase: Adaptation

It was determined that the full list of activities, while important, contained too many activities for effective and meaningful monitoring. Many activities were simply reported as “Ongoing” or “In Progress.”

For the *Draft 2013 ORMP*, the full list of activities (updated and amended) is shown as Appendix B. While all activities are important to get a complete picture of ocean resource management, activities that will be monitored are those that are listed as Management Priorities for the Adaptation Phase and shown in Chapter VI.

Chapter VI outlines and discusses the Perspectives, Goals, Management Priorities, actions, and metrics that will be the focus of the Adaptation Phase.

Ten Management Priorities in coastal zone management were selected because they met one or more of the following criteria:

1. Present an immediate and urgent threat.
2. Present a long term threat, which can lead to irretrievable harm.
3. Work has been initiated by a government agency that requires several years of effort.
4. Work has been initiated by a community group and place-based progress has been demonstrated.
5. The work could be completed during the Adaptation Phase
6. It fits within one of the nine objectives in the National Ocean Policy (NOP).

## VI. Management Priorities for The Adaptation Phase

With this ORMP Update, the ORMP moves into the Adaptation Phase, which is approximately scheduled from 2013 to 2018. Using experiences and lessons learned from the Demonstration Phase, this phase will implement and track actions to accomplish ten Management Priorities.

The collective mission statement of the ORMP Policy Group and Working Group is the overall guidance for the Management Priorities.

### **Mission Statement of the Policy and Working Groups**

*“In support of a healthy and thriving ocean for today and future generations, we are committed to adopting integrated approaches to manage our ocean’s resources by: connecting land and sea; preserving our ocean heritage; and promoting collaboration and stewardship.”*

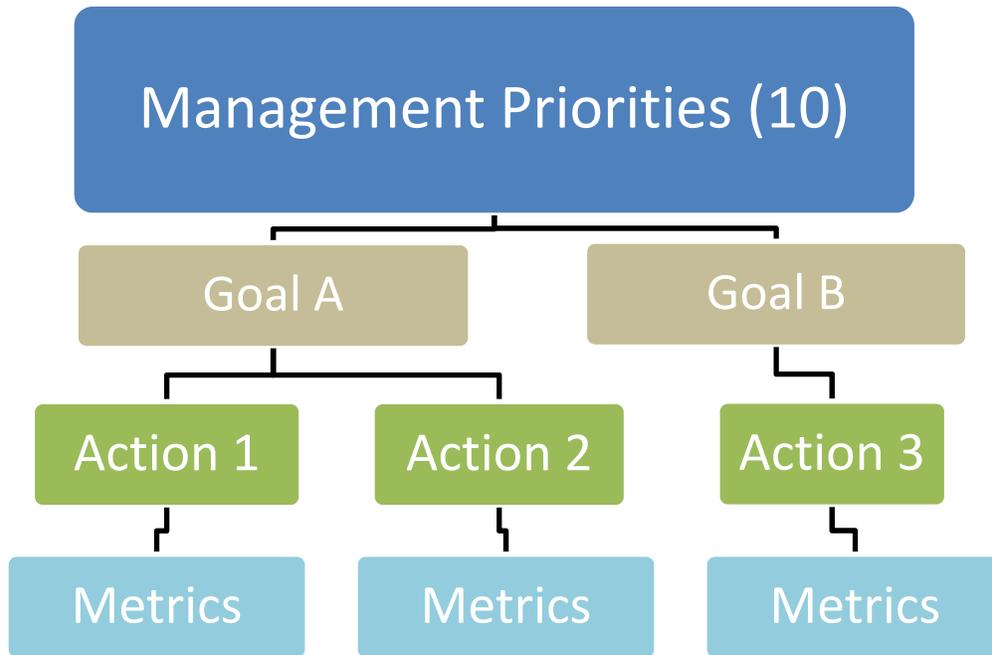
The ten ORMP Management Priorities are not listed in order of importance. Each of these Management Priorities expands upon previous work as the ORMP moves into the Adaptation Phase. The ten Management Priorities are ten coastal zone management areas the State of Hawai‘i would like to address by 2018. These Management Priorities also contain a section called “Where we are now” to give a snapshot of work done in this Management Priority to date. The Management Priorities reference the ORMP Strategies listed in this ORMP Chapter II and the National Ocean Policy Objectives.

Each of the ten Management Priorities has one or more ORMP Goals. In order to accomplish the Goals, there are several Management Priority Actions. These actions are what the ORMP agencies and partners must do to make progress in that goal during the Adaptation Phase. Some of these Management Priority Actions connect with or conform to other statewide plans that have been written by other state agencies.

Management Priority Metrics are measures to track performance towards achieving goals.

Figure 6-1 on the following page shows the relationship between the Management Priorities and their goals, actions, and metrics.

Figure 6-1: Management Priorities Hierarchy



**Management Priorities**

Management Priority #1	Appropriate Coastal Development
Management Priority #2	Watershed Management
Management Priority #3	Marine Invasive Species
Management Priority #4	Marine Debris
Management Priority #5	Coral Reefs
Management Priority #6	Aquaculture, Fishponds, and Food Sources
Management Priority #7	Training, Education, and Awareness
Management Priority #8	Collaboration and Conflict Resolution
Management Priority #9	Community and Place-Based Ocean Management Projects
Management Priority #10	National Ocean Policy and Pacific Ocean Regional Initiatives

## Management Priority # 1 Appropriate Coastal Development

### *Appropriate Coastal Development Goals*

*Goal A: Assist with adoption of county codes for Best Management Practices for coastal development to reduce risks from coastal hazards, sea level rise, and protect the shoreline.*

*Goal B: Use scientific methods to complete erosion risk maps for Main Hawaiian Islands*

References: ORMP Strategies 1.1, 1.2, and 1.3 and National Ocean Policy Objective 5

One of the goals of the CZM Program is to ensure that appropriate setbacks and protections are put into place to avoid inappropriate development and structures along the coastal areas, which would include the objectives and policies in HRS Chapter 205A. These include but are not limited to:

- provision of coastal recreation opportunities to the public;
- protection and preservation of historic resources;
- preservation of scenic and open space;
- protection of coastal ecosystems;
- promotion of protection of marine resources;
- suitable facilities for the state's economy;
- management of development; and
- stimulation of public participation.

While great strides have been made, there are many structures “grandfathered” under old codes, and continued pressure from landowners for exemptions to allow uses along the coast. This pressure can be very contentious and stressful for county and state permitting agencies.

The importance of appropriate development controls and setbacks is magnified by growing information and analysis of the effects of climate change, and in particular sea level rise, which affects all the islands, and which will impact areas already built upon. While the immediacy of this occurrence is not within the next five years, the difficulty in identifying and implementing adaptation measures indicates that work needs to begin now.

One of the key objectives of The National Ocean Policy is to “strengthen resiliency of ocean communities and marine environments...and their abilities to adapt to climate change impacts and ocean acidification.” Disaster avoidance measures would include institutional and governmental measures to reduce risks from coastal hazards. Coastal and cultural resources need protection and one method for that is to reduce building where it is not appropriate. The most difficult measures are those which eliminate building that has already occurred. The goals and objectives of this section shall be consistent with Act 286 (20120, Hawaii's climate adaptation policy.

### Benchmark – Where we are now

- The ORMP Working Group in collaboration with the Center for Island Climate Adaptation and Policy (ICAP) prepared the “*Framework for Climate Change Adaptation in Hawai'i.*” In addition, the Pacific Island Climate Change Cooperative (PICCC) encourages networks of interested parties from Hawai'i and elsewhere in the Pacific region.
- Shoreline erosion studies have been completed for Kaua'i, Maui, and O'ahu.
- The County of Kaua'i Comprehensive Zoning Ordinance, Chapter 8, has fines for any violations.

Target – Where we want to be

- While much is underway, additional information is needed on the science and mapping of sea level rise, and the target is to complete sea level rise maps for every island
- Some would like a comprehensive and integrated shoreline policy

**Figure 6-2: Sea Level Rise Map for Honolulu Harbor Showing 1 meter Sea Level Rise in 2100**



*Source: UH SOEST*

- that addresses the impacts of chronic and episodic coastal hazards. This may or may not involve new or amended state law.
- Identify place-based adaptation strategies, which may include retreat zones, prohibition of shoreline armoring, and assessment of impacts on underground infrastructure and utilities.
  - Encourage public and private property owners to relocate structures inland, with incentives that may include tax-based incentives and third-party acquisition of threatened parcels in fee or by easement.
  - Evaluate proposed projects/actions during the land use entitlement process to determine the sufficiency of proposed adaptation measures and infrastructure durability over the lifetime of the project, taking into account individual and public economic impacts.

**Metrics - Indicator Measure**

- Number of counties implementing planning practices to consider climate change and its potential impacts in respective county plans
- Number of climate change adaptation training sessions held for agency personnel
- Shoreline erosion studies completed for Hawai‘i Island, Lāna‘i, and Molokai

**Agencies Involved**

- \*OP-CZM
- Counties – Planning Departments and County Councils
- DLNR-OCCL
- \*Lead Agency

**Partners**

- Civil Defense Agencies
- DOT
- National Flood Insurance Program
- UH Sea Grant College
- UH SOEST, Coastal Geology

**Operational Plan and Actions to Accomplish This**

- Shoreline erosion studies are needed for Hawai‘i Island, Lāna‘i and Moloka‘i.
- Erosion risk maps need to be created showing rates of shoreline change, volume change, and impacts on coastal parcels.
- There is also a need to reflect mapping of shoreline hazards such as wave inundation, storm surge, and beach erosion. This will require some funding.
- Review projects during land use entitlement process.

## Management Priority # 2 Watershed Management

### *Watershed Management Goals:*

*Goal A: Demonstrate implementation progress of Watershed Management Plans for fifty percent (50%) or more of the watersheds that have Watershed Partnerships.*

*Goal B: Fence upland watersheds to promote reforestation.*

References: ORMP Strategy 1.1 and National Ocean Policy Objectives 1 and 7

### Benchmark – Where we are now

The *Coastal Hazards Atlas* prepared by DLNR Division of Aquatic Resources and Bishop Museum provides place-based information useful for watershed plans. This resource is available online and is a helpful tool to understand watersheds in general.

The Office of Planning, Coastal Zone Management Program prepared another useful resource, the *Hawai‘i Watershed Guidance* (2010), and conducted workshops to promote the *Hawai‘i Watershed Guidance* and reintroduce Hawai‘i’s management measures intended to protect water quality from multiple types and sources of polluted runoff.

There are approximately 580 watersheds in the state according to the *Hawai‘i Watershed Guidance*, although most are small, less than 2,000 acres. Typical watersheds are steep with highly permeable volcanic rock and soil, and with streams that tend to flash flows which are active during heavy rainfall.

OP-CZM and the Department of Health (DOH) identified 50 Priority Watersheds as shown in the text box at right, and these watersheds are eligible for Clean Water Act Section 319 Nonpoint Source Management Program funding. The Polluted Runoff Control Program (PRCP) is administrated by DOH and provides funding to reduce nonpoint source pollution in OP’s priority watersheds.

The DLNR Division of Forestry and Wildlife (DLNR-DOFAW) defines

11 Watershed Partnerships statewide, which include combinations of identified watersheds and also include combinations of public and private land. When discussing watersheds in this section, the ORMP means the 11 Watershed Partnerships, which focus on the mauka portions of these watersheds.

### Department of Health’s Priority Watersheds in Hawai‘i

#### KAUA‘I

Nawiliwili Bay: Puali, Huleai, Nawiliwili Stream Watersheds  
Hanalei Bay: Hanalei, Waikoko, Waipa, Waioli Watersheds

#### O‘AHU

Ala Wai: Mānoa-Palolo, Makiki, Ala Wai Watersheds  
Ko‘olaupoko: Windward Watersheds from Kualoa to Makapu‘u  
Kapakahi Stream Watershed

#### MOLOKA‘I

South Moloka‘i from Kaluape‘elua to ‘Ōhi‘a

#### MAUI

West Maui – Laniupoko to Honolulu

#### HAWAI‘I ISLAND

Pelekane Bay Watershed  
Hilo Bay – Wailuku, Honoli‘i, Pauka‘a, Maili, Pukihae, Wainaku,  
Wailoa

*Source: Hawai‘i Watershed Guidance (2010)*

**DLNR-DOFAW Watershed Partnerships and ORMP Management Priority Watersheds**

- Kaua‘i Watershed Alliance – 25,000 acres of wet forest on Alaka‘i Plateau, Wainiha Valley and east facing pali of northeast Kaua‘i.
- Wai‘anae Mountains Watershed Partnership – Lualualei, Wai‘anae Kai, Mākaha ahupua‘a
- Ko‘olau Mountains Watershed Partnership – 9,000 acres in rainiest parts of the Ko‘olau range that provides drinking water
- East Moloka‘i Watershed Partnership – 33,000 acres that encompasses the rainforest of East Moloka‘i, including remote valleys and sea cliffs.
- Lāna‘i Forest and Watershed Partnership – 3,100 acres in the Lāna‘i hale cloud and mesic forest which provides recharge for much of the water for Lāna‘i residents and agriculture.
- West Maui Mountains Watershed Partnership – 31,100 acres of watershed that provides surface water and groundwater for west and central Maui.
- Leeward Haleakalā Watershed Restoration Partnership – 11,000 acres on south slope of Haleakalā, restoring koa forest and stream flow.
- East Maui Watershed Partnership – 3,500 acres of native montane ‘ōhi‘a forest in upper Hana Forest Reserve, which is part of the larger 114,000 acre East Maui Watershed
- Kohala Watershed Partnership – 6,600 acres of high yield recharge zones that capture 110 million gallons of water per day
- Mauna Kea Watershed Alliance - Restore 512 acres of fenced forest, controlling invasive grasses, and re-establishing connectivity at Kanakealeonui.
- Three Mountain Alliance – 12,000 acres of koa ‘ōhi‘a forest that replenish Ka Lae, Na‘alehu, and Keaiwa aquifers, which provide water for Ka‘ū, Hawai‘i.

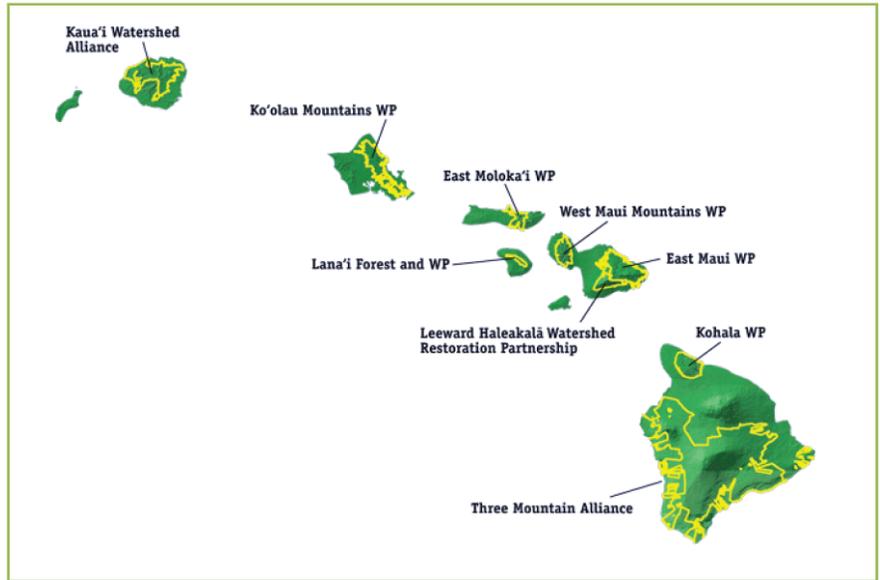
Hawai‘i Water Quality Standards define the classification system for waters, protected uses, establish numeric or narrative water quality criteria, and provide an anti-degradation policy for the defined uses in each class of water (DOH Administrative Rules, 2009).

The Department of Health Polluted Runoff Control Program is to address water quality problems (impairments) through the development and implementation of watershed plans.

The Department of Health prepared the 2006 *Water Quality Monitoring and Assessment Report* (known as the Integrated Report) to address the reporting requirements of the Federal Clean Water Act Sections 305(b) and 303(d). At that time, a total of 209 marine waters were listed as impaired, mostly for turbidity (caused by pollution runoff), nutrients, and bacteria: Kaua‘i 28 (13%), O‘ahu 74 (34%), Moloka‘i 3 (1%), Lāna‘i 6 (3%), Maui 72 (34%), and Hawai‘i 21 (15%).

Hotter, drier conditions are escalating the cost to supply water and intensifying conflicts over its use. A study by UH College of Tropical Agriculture and Human Resources (Kagawa, et al. 2009) shows that Hawaiian native forest plans conserve water use relative to invasive species present in the same forest. This means that more invasive species in a forest means more use of water. Protecting forest watersheds helps absorb rainwater and replenish ground water, and absorbs greenhouse gases. Protecting forests and watersheds helps to buffer heavy rainfall, and therefore reduces flooding, erosion, and siltation of reefs and fisheries. Muddy runoff from eroded lands is the main cause of coral reef loss surrounding the Hawaiian Islands. Many of Hawaii’s estuaries and coastal areas require a supply of fresh water to maintain the ecosystem.

Figure 6-3: Watershed Partnerships in Hawai‘i



Source: Watershed Management Guidance (2010)

Half of Hawaii’s forests have already been lost. Alien species, such as feral pigs and goats, leave bare ground or habitat for alien plants like the strawberry guava that consume more water and increase runoff. The purpose of the *Rain Follows the Forest* initiative of the DLNR is to control these threats on a large scale basis and to protect forest and watershed natural assets. The goal is to double the percentage of watersheds protected in the next decade. The action plan contains projects in areas that receive the most rainfall and are essential to sustaining water resources and biological diversity. Climatic conditions and land cover types that provide high recharge and fog capture are considered when selecting priority projects.

This work is to proceed by DLNR working with the eleven established Watershed Partnerships made up of large public and private land owners and land managers and five island-based Invasive Species Committees made up of private, public, and nonprofit partners.

- Invasive Species Committees**
- O‘ahu Invasive Species Committee
  - Big Island Invasive Species Committee
  - Maui Invasive Species Committee
  - Moloka‘i Invasive Species Committee
  - Kaua‘i Invasive Species Committee

Other Actions in Addition to Watershed Partnerships

County agencies are developing watershed management plans under the State of Hawai‘i Water Code as part of sustainable development. On O‘ahu, the Board of Water Supply (BWS) is preparing one for each of the eight planning districts. The first BWS plans completed include: Wai‘anae, Ko‘olau Loa, and Ko‘olaupoko.

In addition, the U.S. Army Corps of Engineers (USACE) has undertaken watershed studies and restoration projects with state and county agencies. These include:

- West Honolulu Watershed Study: to define potential restoration projects and actions
- Pelekane Bay Ecosystem Restoration Project: to reverse degradation of the coral reef ecosystem
- Central O‘ahu Watershed Study: problems and issues; potential projects to remedy

- Ala Wai Canal Project (with DLNR): Feasibility study of flood hazard reduction and ecosystem restoration
- West Maui Watershed Project: reconnaissance study to use the ahupua‘a concept to solve aquatic, marine, and terrestrial ecosystem degradation and threats to water supply and quality, and storm damage

Target – Where we would like to be

All Watershed Partnerships have a watershed plan developed collaboratively with government agencies, private landowners, stakeholder partners, and community groups, with at least half of them moving towards implementation.

For Watershed Partnerships, the target is to restore and maintain *ahupua‘a* ecosystems, including stream flows to restore native species habitats in wetlands, estuaries, and the ocean. Steps include:

1. Identify streams that need to be restored;
2. Prioritize these;
3. Develop implementation plan with timelines and funding; and
4. Begin restoration.
5. Effectively manage introduced hooved animals in priority portions of Watershed Partnership areas. Improve access and hunting opportunities to assist with animal control in certain areas and increased recreational and subsistence hunting in other locations.
6. Reduce or contain damaging invasive weeds.
7. Monitor and control other forest threats including fires, predators, and plant diseases.
8. Restore and plant native species in priority areas and buffer zones.

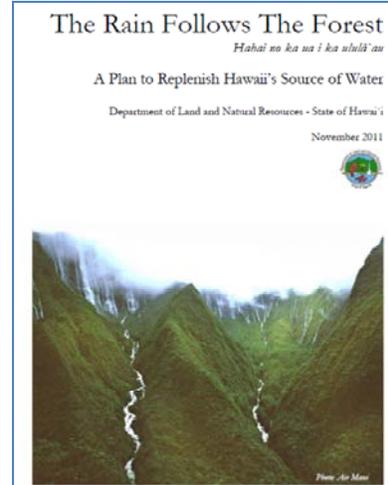
**Metrics - Indicator Measure:**

- Number of watershed plans completed in Watershed Partnerships
- Acreage covered by these plans
- Number of invasive species eradicated or controlled
- Number of streams with a restoration plan identified and underway
- EPA acceptance of Coastal Nonpoint Pollution Control Plan (CNPCP)
- Number of acres where native species have been restored in Watershed Partnership Areas
- Number of acres where introduced hooved animals are effectively controlled
- Number of acres of restored forest
- Number of invasive plant species and individuals controlled

Agencies Involved	Partners
<ul style="list-style-type: none"> <li>• *DLNR-DOFAW</li> <li>• DLNR Commission on Water Resource Management</li> <li>• County water departments and county planning departments</li> <li>• Watershed Partnerships on Kaua‘i, O‘ahu, Lāna‘i, Moloka‘i, Maui (3), and Hawai‘i (2)</li> <li>• DOH-Polluted Runoff Control Program-Section 319</li> <li>*Lead Agency</li> </ul>	<ul style="list-style-type: none"> <li>• DLNR-DAR</li> <li>• The Nature Conservancy</li> <li>• EPA</li> <li>• NOAA</li> </ul>

**Operational Plan and Actions to Accomplish This**

- Support community stewardship through promoting accomplishments and sharing lessons learned.
- Prepare stream restoration plans in priority watersheds.
- Develop collaborative arrangements among stakeholders, such as the volunteer watershed partnerships and invasive species committees which include large landowners and other partners working to protect forest lands, water recharge, and conservation, and habitat.
- Work with EPA and NOAA to resolve issues and procure final acceptance of CNPCP.
- Pursue funding to support continued community stewardship in partnership with government agencies. As provided in the *Rain Follows the Forest Plan*. The plan describes the continuing need for a stable funding source.
- Continue partnerships with other government agencies, non-profits, and private landowners.
- Implement priority recommendations in watershed plans



**Management Priority # 3 Marine Invasive Species**

*Marine Invasive Species Goal:*

*Manage the spread of Aquatic Invasive Species from bays where there is coral or water quality degradation.*

References: ORMP Strategies 2.1 and 2.2 and National Ocean Policy Objective 1

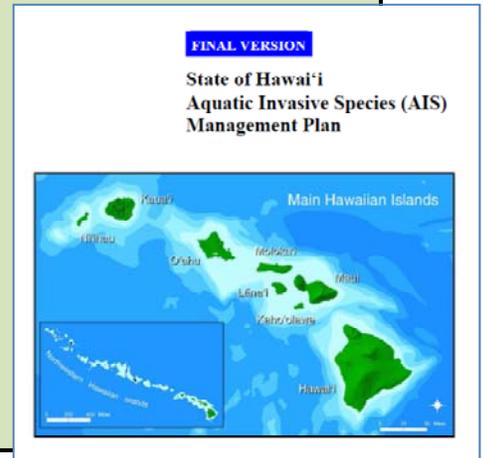
Benchmark – Where we are now:

- Aquatic invasive species pose significant threat to Hawaii’s native plants, animals, ecosystems as well as the human population. While most island ecosystems in the world are highly vulnerable, Hawaii’s isolation magnifies their susceptibility.
- Hawai‘i contains 40% of the threatened and endangered species in the U.S. (Cox, 1999). But as a major transportation hub and tourist destination, the threat of invasion is acutely magnified.
- Establishment of a permanent statewide position for an AIS Coordinator
- The *Hawai‘i Aquatic Invasive Species Management Plan* (AISMP) was prepared in 2003 as a tool to enhance coordination of management efforts and to identify problem areas. This plan is required under the Federal Nonindigenous Aquatic Nuisance Prevention Control Act of 1990 and the National Invasive Species Act of 1996.

**Goal for AIS:** To minimize the harmful ecological, economic, and human health impacts of AIS through the prevention and management of their introduction, expansion, and dispersal into, within, and from Hawai‘i.

**Objectives:**

- Coordination and Collaboration
- Prevention
- Monitoring and early detection
- Response, Control, and Eradication
- Education and Outreach
- Research
- Policy



Examples of aquatic invasive species of concern are:

- Marine algae -- including five species which have become dominant and/or form extensive destructive blooms in areas such as at Kāne‘ohe Bay, Maunalua Bay, and Waikīki on O‘ahu; harbor areas on the Island of Hawai‘i; and the south shore of Moloka‘i; as well as native green algal blooms in Kihei and other coastal areas on Maui.
- Marine fish -- 34 species have been introduced and at least 20 established, according to the AISMP. Many were introduced for planned purposes such as enhancement or bait. Ta‘ape and Roi were introduced as food fish in the 1950s, and there are strong differences of opinions as to their impact on native fish: some feel they are to blame for a decrease in fish abundance. Other non-native fish species become introduced most likely through shipping activity, including mangrove blenny, tasseled blenny, and fang blenny found in various estuaries on O‘ahu.
- Marine invertebrates -- according to the AISMP, surveys by Bishop Museum indicate 201 marine and brackish invertebrate species and 86 cryptogenic species have been introduced, typically arriving through hull fouling or ballast water. Examples are the snowflake coral, Caribbean barnacle, and Philippine mantis shrimp. Purposeful introductions of shellfish include the mangrove crab from Samoa, oysters from San Francisco, and littleneck clams from Japan. Offshore cage aquaculture is a possible new source of marine fish introduction.

Target – Where we would like to be

- Through implementation of strategic actions in the *Hawai‘i Aquatic Invasive Species Plan* there can be reduction of existing invasive species accumulations.
- Through implementing prevention, aggressive monitoring and reporting programs, further introductions and accumulations can be avoided or eliminated shortly after they are discovered.
- Some actions, especially those that are land based activities, involve government permits and/or enforcement.
- Education and awareness are a major management strategy to more effectively control and prevent degradation of the ocean and coastal resources.

<b>Metrics - Indicator Measure</b>	
<ul style="list-style-type: none"> <li>• Ongoing funding for the Ballast Water and Hull Fouling Prevention Program</li> <li>• Development of a risk assessment system with a prioritization element</li> <li>• Number of bays where problem invasive species are eradicated or effectively controlled</li> </ul>	
<b>Agencies Involved</b>	<b>Partners</b>
<ul style="list-style-type: none"> <li>• *DLNR, Division of Aquatic Resources</li> <li>• *Lead Agency</li> </ul>	<ul style="list-style-type: none"> <li>• U.S. Fish &amp; Wildlife Service</li> <li>• The Nature Conservancy</li> <li>• Bishop Museum</li> <li>• Hawai‘i Aquaculture Association</li> <li>• U.S. Coast Guard</li> <li>• NOAA</li> <li>• UH</li> </ul>

**Operational Plan and Actions to Accomplish This**

As contained in the *Hawai‘i Aquatic Invasive Species Plan (2003)*

**Management Priority # 4 Marine Debris***Marine Debris Goal:**Reduce accumulated marine debris from all islands and shores.*

References: ORMP Strategies 2.1 and 2.2 and National Ocean Policy Objective 1

Benchmark – Where we are now:

Marine debris is defined as any solid material disposed of or abandoned in the marine environment. It is a chronic problem for Hawai‘i, and may enter from ships, or arrive as wash from rivers, streams, or storm drains. Depending on its origin, marine debris also has the potential to introduce invasive species. Examples vary greatly, but include plastic bags, bottles, rubber slippers, derelict fishing gear, and abandoned or derelict vessels. Causes may be accidental, illegal dumping, or abandonment of vessels. Land activities that can end up in the ocean include littering, dumping, improper waste management, and industrial losses. Also included are stormwater runoff, materials washed down storm drains, or trash deposited during storms, high winds, or waves.

Hawai‘i’s position in the North Pacific Gyre makes it a hotspot for the aggregation of marine debris. Large floating debris impact marine life (“Ghost fishing”) such as seabirds, Hawaiian monk seals, green sea turtles, and other species which digest the debris or become entangled. Concern over marine debris has received heightened attention recently as the world begins to track Japan Tsunami Marine Debris (JTMD). The Governor has appointed DLNR as the lead agency for JTMD, and marine alien and invasive species risks will be incorporated into the response plan.

The *Hawai‘i Marine Debris Action Plan* (HI-MDAP) was facilitated by NOAA and U.S. EPA with the active participation of the marine debris community, government agencies, NGO, academic, and private interests. The four goals of the HI-MDAP are to:

- Reduce the Backlog of Accumulated Marine Debris;
- Decrease the introduction of solid waste and fishing gear at sea and coastal areas;
- Decrease the number of abandoned and derelict vessels; and
- Reduce land-based debris in waterways

Target – Where we would like to be

Through implementation of strategic actions in the *Hawai‘i Marine Debris Action Plan*, which will be updated in October 2012, the state can reduce marine debris accumulations. Through aggressive monitoring and reporting programs, further introductions and accumulations can be avoided or eliminated shortly after they are discovered. Some actions, especially those that are land-based activities, involve government permits and/or enforcement. Education and awareness are a major management strategy to more effectively control and prevent degradation of the ocean and coastal resources.

<b>Metrics - Indicator Measure</b>	
<ul style="list-style-type: none"> <li>Tons of debris removed by volunteers and/or government actions</li> </ul>	
<b>Agencies Involved</b>	<b>Partner:</b>
<ul style="list-style-type: none"> <li>DLNR (DOFAW or DAR) *DLNR Lead Agency</li> <li>While the Strategic Activities under these goals are primarily assigned to NOAA, there is to be State agency involvement by DLNR (DOBOR), DOT (Harbors), and DOH, as well as the Counties.</li> </ul>	<ul style="list-style-type: none"> <li>PacIOOS</li> </ul>

**Operational Plan and Actions to Accomplish This**

As contained in the *Hawai‘i Marine Debris Action Plan (2010) and (2013)*.

**Management Priority # 5 Coral Reefs***Coral Reefs Goals:*

*Goal A: Coordinate with the Division of Aquatic Resources (DAR) in DLNR to improve the health of coral reefs*

*Goal B: Work with Division of Boating and Ocean Recreation (DOBOR) in DLNR to increase the number of day use pin moorings for commercial and recreational vessels*

References: ORMP Strategy 2.2 and National Ocean Policy Objective 6

The Main Hawaiian Islands are high volcanic islands with non-structural reef communities and fringing reefs abutting the shore. Coral reefs played an important role in Hawaiian culture and subsistence agriculture (Friedlander, et al., 2008). Native Hawaiians, who had intimate knowledge of their ocean resources, practiced species restrictions. Reefs are important habitats, natural buffers, and are part of the marine economy, providing food for sustenance and commerce as well as biotechnology. The *Hawai'i Coral Reef Strategy* quotes a study that estimates the state's coral reefs generate approximately \$800 million annually in added value from marine tourism alone. (Friedlander, 2008).

Declining reef fisheries are shown through comparisons with numerical density, size, and biomass of fish in the shallow reefs of the main islands.

The effects of increased fishing pressure over time and, in some cases, overfishing or other irresponsible practices, are evident across the main Hawaiian Islands. Though many people fish responsibly, enforcement and prosecution of violations of existing fishing regulations are lacking, and regulations often fail to protect some species from harvest before first reproduction.

Recreational uses such as snorkeling, diving, and boating can affect the reefs by breaking skeletons and tissue, altering marine life behavior through feeding, pollution from grey water, and introduction of aquatic invasive species.

One of the greatest threats to the reefs comes from land-based sources of pollution, including sediment, nutrients, cesspools, sewer treatment plant overflow, and road run-off. Excess nutrients promote the growth of algae that compete for space on the benthic reef surfaces and affect the ability of coral to establish and grow.

Climate change impacts on coral include effects from ocean warming, coral bleaching, and ocean acidification. The first large-scale coral bleaching is believed to have occurred in Kāneʻohe Bay (Oʻahu) around 1996 and was due to increases in sea-surface temperature and high light.

Benchmark – Where we are now

- DLNR Division of Aquatic Resources has specific information on coral that will sharpen the ORMP.
- The DLNR Division of Aquatic Resources has specific information in its *Hawai'i Day-Use Mooring Buoy 10-Year Strategic Plan* regarding the installation of day-use pin moorings for recreational and commercial boaters.

Target – Where we would like to be

- Many people, residents, and visitors are not aware of the significance of the coral reefs and how easily they can be damaged. Therefore, education is a key strategy to address coral threats.
- Day use pin moorings could be increased across the state. They are all sub-surface and boaters need local knowledge

<b>Metrics - Indicator Measure</b>	
<ul style="list-style-type: none"> <li>• age-size-growth form parameters for coral health</li> <li>• Species richness and abundance</li> <li>• Habitat</li> <li>• Species diversity</li> <li>• # of day use pin moorings installed</li> </ul>	
<b>Agencies Involved</b>	<b>Partners</b>
<ul style="list-style-type: none"> <li>• *DLNR-DAR Coral Program</li> <li>• DLNR-DOCARE for enforcement</li> <li>• Coral Reef Working Group</li> <li>• DLNR-DOBOR</li> </ul>	<ul style="list-style-type: none"> <li>• The Nature Conservancy</li> <li>• USACE for permitting</li> <li>• DLNR-DOCARE for enforcement</li> </ul>

**Operational Plan and Actions to Accomplish This**

Coordination with DLNR-DAR will help to develop an operational plan to increase the health of Hawaii’s reefs.

Coordination with DLNR-DOBOR will increase the number of day use pin moorings for commercial and recreational vessels

## Management Priority # 6 Aquaculture, Fishponds, and Food Sources

*Aquaculture, Fishponds, and Food Sources Goal:  
Develop aquaculture and mariculture standards, based on current scientific data, to support culturally, environmentally, and economically sustainable operations with the goal to increase local food production.*

References: ORMP Strategies 2.2 and 2.6 and National Ocean Policy Objective 1

### Benchmark – Where we are now

*Fisheries* – Declining reef fisheries are shown through comparisons with numerical density, size, and biomass of fish in the shallow reefs of the main islands compared to the composition in the Northwestern Hawaiian Islands, where there are 260% greater fish stock and a wider array of dominant species. This evidence is corroborated by oral histories and interviews with fishermen locally.

**Figure 6-4: Keawanui Fishpond, Moloka'i**



Source: EPA Project Loko I'a

The effects of increased fishing pressure over time and, in some cases, overfishing or other irresponsible practices, are evident across the main Hawaiian Islands. Though many people fish responsibly, enforcement and prosecution of violations of existing fishing regulations are lacking, and regulations often fail to protect some species from harvest before first reproduction.

*Fishponds* – Hawaiians built rock-walled enclosures in near shore waters to raise fish, an integral part of the ahupua'a. Fish entered through a wooden gate or sluice in the stone wall on the seaward side and as they grew, they became too large to return to the open ocean. In ancient Hawai'i, it was estimated that there were 488 fishponds statewide, and more than 75 fishponds were in production on Moloka'i alone. Yet the fishponds went out of use, became contaminated, and most disappeared.

A revival of fishponds has occurred in recent years, and thirteen have been restored. Six are in use, including three on Moloka'i, one on Maui (Ao'ao Na Loko I'a o Maui at Ko'ie'ie Fishpond), one on Hawai'i Island, and two on O'ahu (He'eia and Kahana's Huilua Fishpond, which is under restoration). Project Loko I'a at the Keawanui fishpond on Moloka'i provides learning and demonstration lessons. Restoration is very labor intensive and difficult work. The *Ko'olauloa Watershed Management Plan* estimates a restoration cost of \$100,000 and annual management costs of \$30,000-40,000 for each fishpond within the Ko'olauloa district.

Agencies involved in restoration include OP-CZM, DLNR, DOH, UH (Sea Grant), EPA, OHA, and others. In addition, there are several community efforts to restore fishponds underway including: Hā'ena and Hanalei on Kaua'i, Mo'omomi on Moloka'i, Pupukeya and Maunalua on O'ahu, Kahekili on Maui, and Miloli'i and West Hawai'i on Hawai'i Island.

*Aquaculture* – Many believe that aquaculture is one of the major potential sources for achieving food security and sustainability in the State of Hawai'i. Demonstration fish farm projects exist, mostly off the Kona coast. Some are concerned with what happens to the wastewater, and whether these farms will attract sharks. The Hawai'i Department of Agriculture has prepared an *Aquaculture Guidebook, Permits and Regulatory Requirements for Aquaculture in Hawai'i* (2011).

Target – Where we would like to be

- Work with involved agencies to develop aquaculture and mariculture standards, based on current scientific data, to support culturally, environmentally, and economically sustainable operations with the goal to increase local food production.

<b>Metrics - Indicator Measure</b>	
<ul style="list-style-type: none"> <li>• Number of restored fishponds</li> <li>• Pounds of food gathered</li> <li>• Number of fish species raised commercially</li> <li>• Pounds of commercially raised fish sold and dollar value</li> <li>• Stock assessments increasing for coral reef fisheries harvested for food</li> </ul>	
<b>Agencies Involved</b>	<b>Partners</b>
<ul style="list-style-type: none"> <li>• *DLNR--DAR</li> <li>• DOA, Aquaculture Development Program</li> </ul> <p>*Lead Agency</p>	<ul style="list-style-type: none"> <li>• USACE (for permits)</li> <li>• NELHA</li> </ul>

**Operational Plan and Actions to Accomplish This**

Work with DLNR-DAR to develop an operational plan.

**Management Priority # 7 Training, Education, and Awareness***Training, Education, and Awareness Goals*

*Goal A: Work in partnership to develop curriculum for training and cross-training state and county agency staff on ocean and coastal protection and begin annual training programs.*

*Goal B: Develop a citizen stewardship awareness and active engagement curriculum for widespread dissemination through various community outlets.*

References: ORMP Strategy 3.2 and National Ocean Policy Objectives 3 and 4

Benchmark – Where we are now

- 1) The science and information on the ocean ecosystems and climate change are rapidly changing. Data collection and monitoring yields new information. Institutional responsibilities, rules, and regulations must be understood by State and County agency staff so that they can make informed decisions. While networking, such as in the ORMP Working Group, provides a valuable exchange of knowledge, there is a dire need for a more systematic way for new staff to receive basic training while allowing all staff to be regularly updated.
- 2) Strong community partnerships in place, for example with the Hawai'i Conservation Alliance, Malama Maunaloa, Kokee Resource Conservation Program, Hanalei Bay Watershed Alliance, and others form an excellent foundation for citizen stewardship. Many of these have public awareness and education as a core function. A regulatory and science-based curriculum, that mirrors that of the staff agencies, would enhance communication between government and the public. Develop curriculum for staff training through public-private-non-profit partnerships.
- 3) State and county planners and officials wish to have training in the science, law, and good management practices for climate change. As government agencies are trained, public education and outreach materials and programs need to be developed and implemented. These outreach materials will reduce the number of requests that have to be denied while propagating a wider understanding and appreciation for new regulations, which will appear onerous to some.

Target – Where we would like to be

- 1) For state agencies, staff should be given a class in environmental literacy and a class in advanced environmental science
- 2) For community outreach:
  - Involve large landowners
  - Develop an app-based system for ocean water quality monitoring and alert system

<b>Metrics - Indicator Measure</b>	
<ul style="list-style-type: none"> <li>• Development of curricula</li> <li>• Assignment of faculty and presentation of first year curricula</li> <li>• Number of attendees by agency</li> </ul>	
<b>Agencies Involved</b>	<b>Partners</b>
<ol style="list-style-type: none"> <li>1. For State Agency Training:                             <ul style="list-style-type: none"> <li>○ DLNR</li> <li>○ DOH</li> <li>○ *Office of Planning, CZM Program</li> </ul> </li> <li>2. MACZAC for Citizen Stewardship and Awareness                             <ul style="list-style-type: none"> <li>*Lead Agency</li> </ul> </li> </ol>	<ul style="list-style-type: none"> <li>• PacIOOS</li> <li>• UH Sea Grant</li> </ul>

**Operational Plan and Actions to Accomplish This**

Needs to be developed.

**Management Priority # 8 Collaboration and Conflict Resolution**

*Collaboration and Conflict Resolution Goal:  
Establish the ORMP Policy Group as a forum for discussion, raising and resolving issues,  
including conflict Resolution when appropriate.*

References: ORMP Strategy 3.2 and National Ocean Policy Objective 3

Benchmark – Where we are now

The ORMP Policy Group and Working Group were established in 2007 and have been meeting regularly since then. They provide a forum for state agencies with county and federal partners as well as academia to share information, improve coordination, and prevent duplication. They offer an opportunity to increase partnerships and collaborations for effective and efficient conservation efforts in the Hawaiian Islands.

Coordinated efforts have the potential to yield better results than would have resulted from a single agency approach. The ORMP groups and sub-groups provide a direct network for agencies and professionals engaged in similar efforts. Knowledge sharing, capacity building and interfacing through participation in the Policy Group and Working Group s enable regular communication and cooperation on mutual interests. While coordination is difficult to measure in a quantitative manner, success in this regard has been noteworthy, as remarked during participant interviews.

Participants note the following benefits they have received from collaboration through the ORMP Groups:

- Creation of a network that they are able to use collectively and in their own work;
- Expanded knowledge of the operations of state and county governments as well as federal activities that may affect state waters;
- Discovering the programs operated by various agencies and learning about the challenges they face and how they are dealing with them; and
- Sharing different perspectives on issues that might not have been otherwise heard.

Target – Where we would like to be

While collaborative implementation of the ORMP has occurred and it is significant, challenges remain that cannot be fully overcome just by collaboration. Budget restricting and staffing changes demonstrate that collaborative governance is essential to carrying out the goals and objectives of the ORMP. What would be a helpful addition is creation of a guiding framework that continues to address collaboration while adding methods for raising complex and overlapping issues, as well as conflict resolution. Staffing for the Policy Group, which is provided by OP, would likely require additional issues to track and vet issues.

<b>Metrics - Indicator Measure</b>	
<ul style="list-style-type: none"> <li>• Number and range of issues addressed by ORMP Policy Group</li> <li>• Number of Management Priority issues that receive state funding and where needed, legislative attention</li> </ul>	
<b>Agencies Involved</b>	<b>Partners</b>
<ul style="list-style-type: none"> <li>• *OP</li> <li>• State agency members: DLNR, DOH, DOA, DOT, SCD, and OHA</li> <li>• County Planning Departments</li> </ul> *Lead Agency	<ul style="list-style-type: none"> <li>• The Sanctuary</li> <li>• USACE</li> <li>• U.S. Navy</li> <li>• USCG</li> <li>• NOAA</li> <li>• EPA</li> <li>• UH SOEST</li> <li>• UH Sea Grant</li> <li>• ICAP</li> <li>• BWS</li> <li>• MACZAC</li> <li>• The Nature Conservancy</li> <li>• PacIOOS</li> </ul>

**Operational Plan and Actions to Accomplish This**

Following completion of the 2013 ORMP, the Policy Group would start to meet more regularly, bi-monthly or quarterly, to work toward implementation of the Adaptation Phase Management Priorities. The agenda could be divided between those issues requiring state or county agency attention, and those broader issues affecting Hawaiian waters and the Pacific Ocean.

**Management Priority #9: Community and Place-Based Ocean Management Projects**

*Community and Place-Based Ocean Management Projects Goals:*

*Goal A: Support existing community level eco-based, place-based ocean management projects*

*Goal B: When funding becomes available, assist in the creation of additional community level eco-based, place-based ocean management projects.*

References: ORMP Strategies 3.1, 3.3, and 3.5 and National Ocean Policy Objective 6

Place-based initiatives during the Demonstration Period proved effective and flexible. A variety of models for integrated government and community engagement emerged as appropriate for each place. Many projects involve active involvement of community who work to restore part of an ecosystem and began to monitor and watch that ecosystem. As projects move forward and results start to be seen, they attract additional interest and resources, creating still further results.

Benchmark – Where we are now

Demonstration period yielded over a dozen examples of place-based community engagement and stewardship. Places where this occurred during the Demonstration period include: He’eia Kea (O’ahu), Ala Wai Watershed Project (O’ahu), Hanalei (Kaua’i), Honu’apo Estuary (Hawai’i Island), Hilo Bay (Hawai’i Island), Pu’u O Umi Natural Reserve and Kohala Natural Reserve (Hawai’i Island), Maunalua Bay (O’ahu), and West Maui Watershed (Maui). The West Maui Watershed is now called the West Maui Ridge to Reef Initiative. Lessons learned from communities need to be posted as references for others.

Target – Where we would like to be

- Help community groups establish themselves and continue their work. Where applicable, assist them to navigate the permit process associated with their restoration efforts, and develop BMPs for restoration work through information and expertise sharing.
- Identify other projects working with the community

Metrics - Indicator Measure	Agencies Involved
<ul style="list-style-type: none"> <li>• Number of projects already underway and expanded</li> <li>• Number of new community projects started</li> <li>• The Hawai’i Annual Report on NOAA National Performance Standards (NPS) on the OP-CZM webpage is posted</li> <li>• National Estuarine Research Reserve Site (NERRS) is designated</li> <li>• A Coastal and Marine Spatial Plan for Hawai’i Territorial Sea is established</li> </ul>	<ul style="list-style-type: none"> <li>• *OP-CZM</li> <li>• DLNR in partnership with US Army Corps of Engineers, Kā’anapali Makai Watch, DOH, NOAA and others for West Maui Ridge to Reef Initiative</li> </ul> <p>*Lead Agency</p>

**Operational Plan and Actions to Accomplish This**

- OP Annual Reports
- OP updates its website with community-based efforts and outcomes
- OP develops coastal and marine spatial mapping (CMSP) capability

## Management Priority # 10: National Ocean Policy and Pacific Ocean Regional Initiatives

*National Ocean Policy and Pacific Ocean Regional Initiatives Goals:*

*Goal A: Identify Pacific Regional Priorities for Pacific Regional Ocean Partnership (PROP).*

*Goal B: Establish a Coastal and Marine Spatial Plan for the Hawaiian Archipelago.*

References: ORMP Strategy 3.4 and National Ocean Policy Objective 4

The National Ocean Policy was formulated in 2010 by a Task Force of Federal Agencies to create a framework for collaboration that would enhance the country's ability to maintain healthy, resilient, and sustainable oceans, coast and Great Lake resources. The framework developed called for nine regional planning areas, which are now in formation.

One objective of the regional initiatives is to create graphic information on the condition of the oceans as an aid in the development of public policy and decision making. This coastal and marine spatial mapping (CMSP) would be a tool tied to the State's GIS capabilities. The goal is to complete a CMSP Plan for the Hawaiian Archipelago.

### Benchmark – Where we are now

The Pacific Regional Ocean Partnership (PROP) was formed in 2012. A Memorandum of Agreement to formalize working relationships was circulated and the last signatory made in August 2012. The members include: State of Hawai'i, Commonwealth of the Northern Mariana Islands (CNMI), Guam, and American Samoa. The PROP highlights the importance of gathering rights, cultural sensitivities, and unique island geographies in the management of ocean resources.

The State of Hawai'i decided to form a Sub-Regional Ocean Partnership (Hawai'i Sub-ROP). The area is co-managed by the State of Hawai'i Department of Land and Natural Resources and the Office of Planning. It spans 1,523 miles of the main Hawaiian Islands as well as the Northwestern Hawaiian Islands (Papahānaumokuākea Marine National Monument (co-managed by NOAA, US Fish & Wildlife, and DLNR). This area also includes the 12-nautical mile Territorial Sea and the 200-nautical mile Exclusive Economic Zone. The purpose of the Sub-ROP is to formalize partnerships among governments along with coastal communities, cultural practitioners, economic (commercial fishing and tourist) interests, and other stakeholders to work together and to ensure consistency with national ocean objectives.

### Target – Where we would like to be

While the PROP (signed in August 2012) is a living document, the ten regional objectives are to:

- Promote regional sustainability of resources that supports individual state requirements;
- Facilitate the implementation of the priority objectives of the President's Executive Order 13547 of July 19, 2010, which established the National Ocean Policy;
- Foster cooperation and collaboration on all aspects of ocean and coastal-related research and development, education, exploration and observation, and oceans management;
- Coordinate and communicate regional priorities;
- Facilitate the exchange of information, including reports, discussions, initiatives and plans that may be developed or considered;

- Facilitate preservation of the historical, cultural and social heritage of each state and the region;
- Identify opportunities for collaborative work in the ocean and coastal environment;
- Enhance current state, multi-state, and federal governance and institutional mechanisms to manage ocean and coastal resources;
- Seek additional resources and funding opportunities to further the PROP’s objectives; and
- Address related environmental issues.

Metrics - Indicator Measure	
<ul style="list-style-type: none"> <li>• Number of meetings (gatherings of the PROP each year)</li> <li>• Number of issues raised and information exchanged at the PROP</li> <li>• Number of collaborative initiatives undertaken at the PROP</li> </ul>	
Lead Agency	Partner Agencies
<ul style="list-style-type: none"> <li>• OP-CZM</li> </ul>	<ul style="list-style-type: none"> <li>• U.S. Coast Guard</li> <li>• Bureau of Ocean Management, U.S. Department of the Interior</li> </ul>

**Operational Plan and Actions to Accomplish This**

The PROP has been formed. Meetings scheduled and topic will be developed in 2013.  
 The Hawai‘i Sub-ROP has been formed. Meetings scheduled and topic will be developed in 2013.

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# Acronyms

ACT	Action Coordination Team
AIS	Aquatic Invasive Species
AIS Team	Aquatic Invasive Species Response Team
AISMP	<i>Hawaii Aquatic Invasive Species Management Plan</i>
BMP	Best Management Practices
BVR	Beach Vulnerability Rating Project
BWS	Honolulu Board of Water Supply
CEC	Commission for Environmental Cooperation
CEQ	Council on Environmental Quality
CMSP	Coastal and marine spatial planning
CNMI	Commonwealth of the Northern Mariana Islands
CNPCCP	Coastal Nonpoint Pollution Control Program
COEMAP	DLNR Coastal Erosion Management Plan
CRP	NOAA Cooperative Research Program
CSI	Cumulative and Secondary Impacts
CWRM	Commission on Water Resources
CZM	Coastal Zone Management
DAR	DLNR Division of Aquatic Resources
DBEDT	Department of Business, Economic Development and Tourism
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOBOR	DLNR Division of Ocean Boating and Ocean Recreation
DOCARE	DLNR Division of Conservation and Resources Enforcement
DOFAW	DLNR Division of Forestry and Wildlife
DOH	Department of Health
DOT	Department of Transportation
DP	Development Plan
EA	Environmental Assessment
EBM	Ecosystem-Based Management
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPICS	Climate Extremes in the Pacific Integrated Case Studies
ESA	Endangered Species Act
FMA	Fishery Management Areas
GIS	Geographic Information System
GMO	Genetically Modified Organism
GPS	Global Positioning Satellite
HCA	Hawai'i Conservation Alliance
HCDA	Hawai'i Community Development Authority
HCEI	Hawai'i Clean Energy Initiative
HIMB	Hawai'i Institute of Marine Biology
HI-MDAP	<i>Hawai'i Marine Debris Action Plan</i>
HRS	Hawaii Revised Statutes
ICAP	University of Hawai'i Sea Grant College Program, Center for Island Climate Adaptation and Policy
IOOS	U.S. Integrated Ocean Observing System

IOPTF	Interagency Ocean Policy Task Force
IPCC	Intergovernmental Panel on Climate Change
JTMD	Japan Tsunami Marine Debris
KIRC	Kaho‘olawe Island Reserve Commission
MACZAC	Marine and Coastal Zone Advocacy Council
MACZMAG	Marine and Coastal Zone Management Advisory Group
MLCD	Marine Life Conservation Districts
MMA	Marine Managed Area
NAR	Natural Area Reserve
NELHA	National Energy Laboratory of Hawai‘i Authority
NERRS	National Estuarine Research Reserve System
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NOP	National Ocean Policy
NPDES	National Pollutant Discharge Elimination System
NPS	National Performance Standards
OCCL	DLNR Office of Conservation and Coastal Lands
OCRM	NOAA’s Office of Ocean and Coastal Resource Management
OCS	Outer Continental Shelf
OHA	Office of Hawaiian Affairs
ONMS	Office of National Marine Sanctuaries
OP	Office of Planning
OP-CZM	State of Hawai‘i, Office of Planning, Coastal Zone Management Program
ORMP	<i>Hawai‘i Ocean Resources Management Plan</i>
PacIOOS	Pacific Islands Ocean Observing System
PaCIS	Pacific Climate Information System
Pac RISA	Pacific Regional Integrated Sciences and Assessments
PASH	Public Access Shoreline Hawai‘i
PICCC	Pacific Island Climate Change Cooperative
PIFSC	NOAA’s Pacific Islands Fisheries Science Center
PIRCA	Pacific Islands Regional Climate Assessment
PLS	Public Listening Sessions
PRC	DOH Polluted Runoff Control Program
PRiMO	Pacific Risk Management Ohana
PROP	Pacific Regional Ocean Partnership
ROMS	Regional Ocean Modeling System
ROS	Revised Ordinances of Honolulu
RPB	Regional Planning Body
RPS	Renewable Portfolio Standards
SA	Strategic Actions
SAM	Shoreline Assessment Model
SCD	Hawai‘i State Civil Defense
SLH	Session Laws of Hawaii
SLR	Sea Level Rise
SMA	Special Management Area
Sub-ROP	Hawai‘i Sub-Regional Ocean Partnership
SSBN	OCCL Small Scale Beach Nourishment Program
SWAN	Simulating Waves Nearshore
UH	University of Hawai‘i
UH CTAHR	University of Hawaii Cooperative Extension Service, College of Tropical Agriculture and Human Resources

UHERO	University of Hawai'i Economic Research Organization
UH SOEST	University of Hawai'i School of Ocean and Earth Science and Technology
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
USACE	U.S. Army Corps of Engineers
USGC	U.S. Coast Guard
WHRFMA	West Hawai'i Regional Fisheries Management Area
WMMWP	West Maui Mountains Watershed Partnership
WRF	Weather Research and Forecasting Model
WW III	WaveWatch III

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## Appendix A: Resources for Communities in Coastal and Marine Stewardship

Throughout the process of updating the ORMP, communities across the island state have asked how they can access more assistance for their projects. From Anahola, Kaua'i where community members are rebuilding the ancient Hawaiian Fish Pond at their shoreline to the fish ponds of Moloka'i, from water quality monitoring concerns at Hulupoe Bay on Lāna'i to runoff issues at Kawaihae Harbor on Hawai'i Island, communities wanted to sustain their ocean resources, but they needed assistance. Some knew what had to be done but needed help with Federal and State permitting processes. Others had a vision for how their group could improve their resource but needed technical assistance for grant applications. And others had worked for decades on projects that had not come to fruition and could not prevail over their years of frustration.

There are many funding opportunities for communities doing work that matches the framework in the ORMP Three Perspectives: Connecting Land and Sea; Preserving Our Ocean Heritage; and Promoting Collaboration and Stewardship. These include:

### ***National Oceanic and Atmospheric Administration Community-based Restoration Program***

NOAA's Community-based Restoration Program (CRP), which is part of the Habitat Conservation of the National Marine Fisheries Service, supports priority projects in Hawai'i that can address threats to the coastal ecosystem. CRP partners with grassroots organizations to encourage hands-on community participation in restoration projects. CRP delivers technical support along with funds for projects in order to help ensure restoration success.

examples of funded programs are the Okeleha Trail Erosion Control Restoration and the Waipa Fishpond and Estuarine Habitat Restoration Project, both located in Hanalei on the island of Kaua'i and both implemented by The Hanalei Watershed Hui.

Funding opportunities, guidelines, and proposal applications can be accessed here:  
<http://www.habitat.noaa.gov/funding/southwest.html>

### ***NOAA Marine Debris Program***

NOAA supports several grant opportunities for removal of marine debris. The first is in partnership with NOAA CRP mentioned above, and the second is a public-private partnership called Fishing for Energy.

The NOAA CRP grants typically open each summer with proposals due in either late October or early November. Funding of up to \$2,000,000 is expected to be available for Community-based Marine Debris Removal Project Grants in fiscal year 2012.

The Fishing for Energy Small Grants Fund is administered in partnership with the NOAA Marine Debris Program, Covanta Energy Corporation, Schnitzer Steel Industries, and the National Fish and Wildlife Foundation. This grant provides funding to Fishing for Energy Partnership ports, their partners, or other commercial fishing ports for disposal of old, abandoned, or derelict fishing gear.

Funding opportunities, guidelines, and proposal applications can be accessed here:  
<http://marinedebris.noaa.gov/funding/welcome.html>

### ***Hawai'i Conservation Alliance***

The Hawai'i Conservation Alliance is a cooperative collaboration of conservation leaders representing government, education, and non-profit organizations. The purpose of the HCA is to work together to continue stewardship and promote preservation, to increase diversity of native species, and to ensure continued maintenance of Hawai'i's biodiversity. The nineteen organizations currently in HCA are many of the same organizations represented formally in the ORMP Working Group, and will be many of the same organizations represented in the Hawai'i Sub-ROP. This alliance fits within all Three Perspectives.

HCA holds an Annual Hawai'i Conservation Conference, which celebrated its 20<sup>th</sup> Anniversary in 2012. HCA also aggregates many different funding opportunities on its website. Further information can be accessed here:

<http://hawaiiconservation.org/resources/grants>

### ***Harold K. L. Castle Foundation***

The Castle Foundation provides annual grants to nonprofit organizations serving Hawai'i if they have Internal Revenue Code Sections 501(c)(3) and 509(a) public charity status. The Castle Foundation also provides grants to Hawai'i public schools. The funding cannot be used for ongoing operating expenses unless it is a new project or new organization seeking start-up funding.

The categories for funding include: Public Education Redesign and Enhancement; Nearshore Marine Resource Conservation; Strengthening the Communities of Windward O'ahu; and Other Investments. The grants relating to Nearshore Marine Resource Conservation fit with Perspective Two: Preserving Our Ocean Heritage and Perspective Three: Promoting Collaboration and Stewardship.

Information about the Castle Foundation grants and resources for grant seekers is available here:

<http://www.castlefoundation.org/grantseeker-resources.htm>

### ***Hawai'i Alliance of Nonprofit Organizations***

The Hawai'i Alliance of Nonprofit Organizations (HANO) provides leadership, advocacy, research information, communications, professional development, and products and services for the nonprofit sector in Hawai'i. For community organizations seeking to become a formal non-profit, HANO provides several website links in Hawai'i and in the United States to complete this process. Links to resources for nonprofits and those starting a nonprofit can be found here:

<http://hano-hawaii.org/resources/>

### ***Makai Watch***



DLNR partners with community groups and Non-Government Organizations as part of the Mauka-Makai Watch Program. The Makai Watch component of this project focuses on near-shore marine resources and community-based participation. The Makai Watch Program consists of three main components: 1) Building Community Awareness and Outreach; 2) Biological and Human Use Monitoring; and 3) Incident Observation and Encouraging Compliance

The nine DLNR-recognized Makai Watch groups operating are:

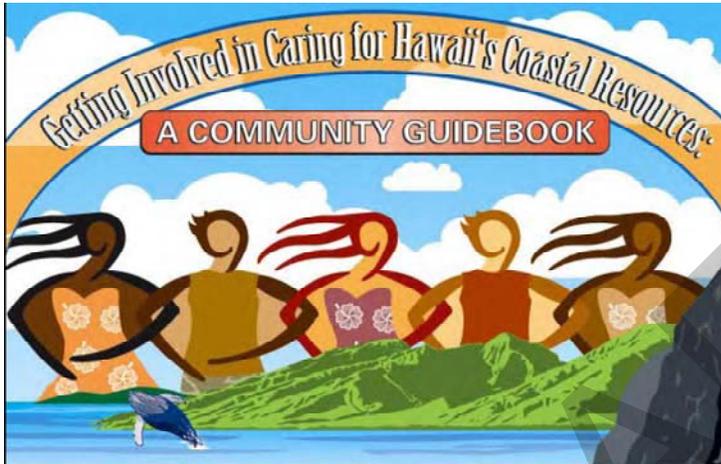
- 1) Puakō, Hawai'i
- 2) Ka'upulehu and Kukio, Hawai'i
- 3) Ka'anapali/Kahekili, Maui

- 4) 'Ahihi-Kina'u Natural Area Reserve, Maui
- 5) Pūpūkea-Waimea, O'ahu
- 6) Maunalua Bay, O'ahu
- 7) Waikiki, O'ahu
- 8) Hanalei, Kaua'i
- 9) Hā'ena, Kaua'i

Anyone can get involved by contacting the Makai Watch coordinator on their island:

<http://www.hawaiicoralreefstrategy.com/index.php/makai-watch-on-going>

### ***Getting Involved in Caring for Hawai'i's Coastal Resources***



DLNR's Division of Aquatic Resources distributes a community guidebook with support from NOAA's Coral Reef Management Grant. The guide gives advice on how to start a community-based project, develop an action plan, prioritize projects, and find funding. Related activities, additional resources, and contact information is also provided.

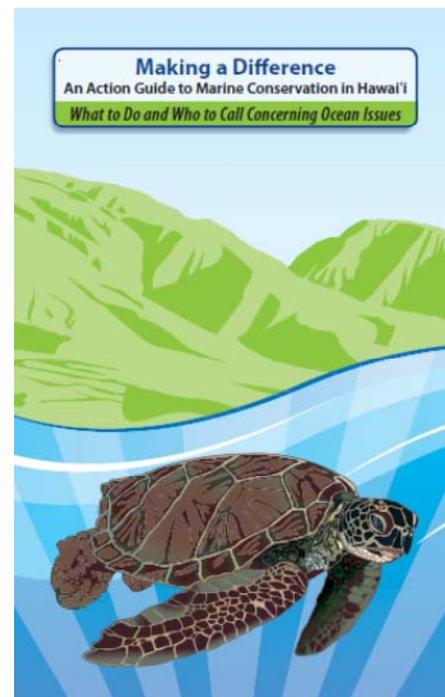
[http://coralreef.noaa.gov/education/educators/resourcecd/guides/resources/hi\\_resources\\_g.pdf](http://coralreef.noaa.gov/education/educators/resourcecd/guides/resources/hi_resources_g.pdf)

### ***Making a Difference Action Guide***

OP CZM Program, in cooperation with Project S.E.A.-Link and NOAA, distributes an *Action Guide to Marine Conservation in Hawai'i*. The guide was designed as a tool to provide communities with key information, guidelines, and contact information for ocean users to participate in marine conservation.

Included in the contact information are the myriad of agencies at all levels of government in a handy marine enforcement phone book.

[http://www.hawaiicoralreefstrategy.com/PDFs/14\\_Makai\\_Watch\\_On-going/EntireGuideBook.pdf](http://www.hawaiicoralreefstrategy.com/PDFs/14_Makai_Watch_On-going/EntireGuideBook.pdf)



### ***Hawai'i Community Stewardship Directory***

The Office of Planning CZM Program developed this directory to help community groups and organizations involved in natural and cultural resources management connect with each other, share their experiences, and exchange lessons learned. OP-CZM updates this directory periodically as one element of the ORMP. To date, 114 organizations across Hawai'i have requested inclusion in this directory.



[http://hawaii.gov/dbedt/czm/initiative/community\\_based/May2010\\_HawaiiCommunityStewardshipDirectory.pdf](http://hawaii.gov/dbedt/czm/initiative/community_based/May2010_HawaiiCommunityStewardshipDirectory.pdf)

### ***Project S.E.A.-Link***



Project S.E.A.-Link is a nonprofit organization based on Maui and founded in 1999. This nonprofit works with volunteers on all islands to implement community-based coral reef monitoring. A volunteer can conduct reef fish surveys or participate in the ReefWatchers program to collect information on the impact humans have on the reef itself. There are also educational, science, and awareness links available.

<http://projectsealink.org/index.html>

### ***Marine and Coastal Zone Advocacy Council (MACZAC)***

[Chapter 205A-3.5 of the Hawaii Revised Statutes](#) clarifies the Office of Planning's responsibility to maintain a public advisory body (MACZAC). The body is composed of twelve advisory members recruited from the Islands of Kaua'i, O'ahu, Maui, Moloka'i, Lana'i, and Hawai'i, who have diverse backgrounds in business, environment, native Hawaiian practices, terrestrial and marine commerce, recreation, research, and tourism. MACZAC's mission statement is: "Advocate for a comprehensive management system which restores, preserves and protects Hawaii's marine and coastal environment." MACZAC is an integral part of the ORMP.

<http://www.state.hi.us/dbedt/czm/maczac/maczac.php>

## Appendix B: 2012 Status of Strategic Actions from 2006 *ORMP* and 2008 *ORMP Consolidated Work Plan*

The 2006 *ORMP* (Tables 1, 2, and 3) contained 10 Management Goals and 28 Strategic Actions. In order to accomplish each of these goals, a list of over 100 sub-actions was developed.

In 2008, an *ORMP Consolidated Work Plan* was written, giving a status update for each of the Strategic Actions and sub-actions.

In 2012, the status updates were given by each agency in preparation for this *ORMP* update.

Appendix B is a list of outstanding Strategic Actions and sub-actions adapted from the 2008 *ORMP Consolidated Work Plan*. The completed actions are listed in Chapter V.

Lead agencies may not always be state agencies, based on the action and the collaboration needed to complete it.

**PERSPECTIVE ONE: CONNECTING LAND AND SEA: *Careful and appropriate use of the land is required to maintain the diverse array of ecological, social, cultural, and economic benefits we derive from the sea.***

Strategies, Actions, and Sub-Actions	Lead	Status
<b>Strategy 1.1: Improve coastal water quality by reducing land-based sources of pollution and restoring natural habitats, and protecting beaches, shorelines, and coasts.</b>		
<b>Action 1: Reduce soil erosion from upland forest ecosystems and conservation lands</b>		
<ul style="list-style-type: none"> <li>Implement and monitor best management practices to reduce upland soil erosion caused by feral animals, loss of native forest species, and other anthropogenic factors</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Expand watershed partnerships and similar public-private partnerships to improve management of upland forest ecosystems and conservation lands</li> </ul>	DLNR, Landowners	Ongoing
<ul style="list-style-type: none"> <li>Leverage State, federal, and private sector funding to implement best management practices</li> </ul>	DLNR	Ongoing
<b>Action 2: Reduce pollutant loads from residential, agricultural, and commercial land uses in priority watersheds</b>		
<ul style="list-style-type: none"> <li>Identify priority watersheds, major land covers, land uses, and polluting activities</li> </ul>	DOH	Ongoing
<ul style="list-style-type: none"> <li>Characterize pollutant loads from surface runoff, point sources, and groundwater discharge</li> </ul>	DOH	Ongoing
<ul style="list-style-type: none"> <li>Implement watershed implementation plans, total maximum daily load implementation plans, and local action strategies to address land-based pollution threats</li> </ul>	DOH	Ongoing
<ul style="list-style-type: none"> <li>Implement best practices to reduce pollutant loads</li> </ul>	Landowners	Ongoing
<ul style="list-style-type: none"> <li>Increase water quality monitoring in identified areas of concern</li> </ul>	DOH	Ongoing
<b>Action 3: Restore and protect wetlands, streams and estuaries</b>		
<ul style="list-style-type: none"> <li>Develop an education program for land owners, land managers, farmers, and others on the importance of incorporating best management practices to preserve riparian and wetland habitats</li> </ul>	OP, DOH	New in 2006
<ul style="list-style-type: none"> <li>Improve interagency coordination, effectiveness and efficiency in wetlands management through the creation of a watershed coordinating committee to ensure ecological function is maintained to the greatest extent practicable</li> </ul>	OP, DOH, Counties	New in 2006
<ul style="list-style-type: none"> <li>Identify channelized streams in priority watersheds for restoration and revitalization of wetland and estuarine habitats, prioritize streams for restoration and initiate restoration planning and implementation</li> </ul>	DLNR-CWRM, Counties	New in 2006
<b>Strategy 1.2: Improve conservation and management of beaches, dunes, and wetlands to protect communities from shoreline erosion and other coastal hazards</b>		
<b>Action 4: Develop and implement a comprehensive and integrated shoreline management plan to address coastal development and the reduction of coastal erosion and other chronic and episodic coastal hazards</b>		
<ul style="list-style-type: none"> <li>Establish a consensus on policies, management strategies and remedial actions to address shoreline erosion, beach loss, and mitigation of other coastal hazards</li> </ul>	DLNR, OP, SOEST	Ongoing

**PERSPECTIVE ONE: CONNECTING LAND AND SEA: *Careful and appropriate use of the land is required to maintain the diverse array of ecological, social, cultural, and economic benefits we derive from the sea.***

Strategies, Actions, and Sub-Actions	Lead	Status
<ul style="list-style-type: none"> <li>Develop comprehensive policies adopted through interagency agreements that treat shoreline management as a single integrated administrative unit and provide agencies with practical tools and skills necessary to improve management, minimize shoreline erosion and protect communities from coastal hazards</li> </ul>	DLNR, OP, Counties	Ongoing
<ul style="list-style-type: none"> <li>Develop and implement policy and management strategies that account for projected sea level rise of 1 meter by 2050</li> </ul>	Counties	NEW
<ul style="list-style-type: none"> <li>Establish adaptation strategies such as retreat zones, prohibiting shoreline armoring, and develop incentives to relocate structures inland</li> </ul>	Counties	NEW
<ul style="list-style-type: none"> <li>Encourage permitting authorities to analyze coastal hazards, risks, and threats to beach protection prior to any zoning changes, Special Management Area/Shoreline setback variance permits or building permits</li> </ul>	OP	Ongoing
<ul style="list-style-type: none"> <li>Conduct training programs utilizing practical tools to build capacity of government agencies and private sector to plan for and implement integrated shoreline management</li> </ul>	DLNR, OP, Counties, SOEST	Ongoing
<ul style="list-style-type: none"> <li>Conduct statewide beach and shoreline assessment to identify high risk/erosion prone areas based on risk of coastal erosion, hazards, vulnerability of coastal communities, threats to beach protection, and presence of coastal resources and recreational areas</li> </ul>	SOEST, DLNR, Counties	Ongoing
<ul style="list-style-type: none"> <li>Develop and implement coastal erosion and hazard mitigation management measures in priority areas</li> </ul>	DLNR, OP Counties	Ongoing
<ul style="list-style-type: none"> <li>Identify and implement innovative mechanisms for coastal land acquisition and funding as an effective measure to preserve beaches and other coastal assets</li> </ul>	DLNR, Counties	Ongoing
<ul style="list-style-type: none"> <li>Prepare an integrated management plan to prioritize areas for active management</li> </ul>	DLNR	New
<ul style="list-style-type: none"> <li>Conduct coastal hazard and resource assessment and risk analysis for any proposed coastal development</li> </ul>	SOEST, Counties	Ongoing
<ul style="list-style-type: none"> <li>Require all new coastal development projects and plans as part of permit process to identify specific measures to mitigate risks associated with coastal hazards, protect sensitive coastal and cultural resources, and ensure public access</li> </ul>	OP, DLNR, Counties	Ongoing
<ul style="list-style-type: none"> <li>Develop an on-line statewide shoreline information management system on coastal hazards and risks, and beach protection in coastal areas</li> </ul>	DLNR, SOEST	Ongoing
<ul style="list-style-type: none"> <li>Research, develop and institutionalize a methodology for assessing what proportion of a region's surface water runoff and erosion impacts are generated by any given development project</li> </ul>	OP	New in 2006
<p><b>Strategy 1.3: Improve and ensure maintenance and appropriate use of environmental infrastructure</b></p>		
<p><b>Action 5: Reduce the number of individual wastewater systems and illegal stormwater discharges to the wastewater system while inspecting and maintaining sewer collections systems, especially in the coastal environment.</b></p>		

**PERSPECTIVE ONE: CONNECTING LAND AND SEA: *Careful and appropriate use of the land is required to maintain the diverse array of ecological, social, cultural, and economic benefits we derive from the sea.***

Strategies, Actions, and Sub-Actions	Lead	Status
<ul style="list-style-type: none"> <li>Repair leaking sewers in priority watersheds</li> </ul>	Counties	Ongoing
<ul style="list-style-type: none"> <li>Develop appropriate incentive system to ensure funding for sewer upgrades are prioritized in County budgets</li> </ul>	Counties	Ongoing
<ul style="list-style-type: none"> <li>Develop long-term infrastructure plan to ensure complete hookup to and adequate capacity and maintenance of wastewater systems</li> </ul>	Counties	Ongoing
<ul style="list-style-type: none"> <li>Conduct an inventory of individual wastewater disposal systems in coastal areas</li> </ul>	DOH, Counties	Ongoing
<ul style="list-style-type: none"> <li>Encourage the elimination of cesspools by providing incentives for private upgrades</li> </ul>	DOH	Ongoing
<ul style="list-style-type: none"> <li>Develop appropriately scaled wastewater treatment systems in coastal areas with planned growth</li> </ul>	Counties	Ongoing
<ul style="list-style-type: none"> <li>Conduct public education campaign explaining the impacts of illegal storm-water discharges to public sewers on coastal water quality</li> </ul>	DOH	Ongoing
<ul style="list-style-type: none"> <li>Conduct neighborhood reconnaissance to remind and warn residents about impacts of illegal storm-water hookups</li> </ul>	DOH	Ongoing
<ul style="list-style-type: none"> <li>Develop new rules establishing penalties for noncompliance</li> </ul>	DOH	Ongoing
<p><b>Action 6: Through integrated policies and plans, ensure fresh water quantity is maintained in aquifers and streams to assist with restoration of flows to wetlands, streams, estuaries, and near shore waters.</b></p>		
<ul style="list-style-type: none"> <li>Establish inflow stream standards</li> </ul>	DLNR-DWRM, County Water Agencies	New and Ongoing
<p><b>Strategy 1.4: Resiliency and Adaptation to Climate Change and Ocean Acidification</b></p>		

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Strategies, Actions, and Sub-Actions	Lead	Status
<b>Strategy 2.1: Improve coastal water quality by reducing marine sources of pollution</b>		
<b>Action 7: To preserve the economic drivers of agriculture and tourism, minimize the introduction and spread of marine alien and invasive species into and throughout archipelagic waters, promote sustainable ocean-based tourism, and improve enforcement capacity of all rules and laws relating to ocean resource protection.</b>		
<ul style="list-style-type: none"> <li>Develop a risk-based approach to identify species and areas with the highest potential for introduction and spread of marine AIS and ecological and economic damage</li> </ul>	DLNR, SOEST	Ongoing
<ul style="list-style-type: none"> <li>Organize technical, financial, and management resources for effective prevention; monitoring and early detection; and response, eradication, and control for high-risk species and areas</li> </ul>	DLNR, DOA, PaclOOS	Ongoing
<ul style="list-style-type: none"> <li>Organize and train local action teams for the monitoring and control of marine AIS</li> </ul>	DLNR, USCG	Ongoing
<ul style="list-style-type: none"> <li>Review existing State laws and regulations to increase effectiveness of marine AIS prevention and control</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Establish a technical committee to redefine wastewater-discharge restricted zones for commercial vessels in archipelagic waters based on currents, depths, and weather conditions</li> </ul>	USGS	New in 2006
<ul style="list-style-type: none"> <li>Enforce existing federal and State regulations on wastewater-discharge restricted zones in archipelagic waters with a monitoring and enforcement plan</li> </ul>	USCG	Ongoing
<b>Action 8: Provide appropriate waste management infrastructure to support commercial and recreational marine facilities</b>		
<ul style="list-style-type: none"> <li>Improve filtration systems for stormwater runoff</li> </ul>	Counties	New
<ul style="list-style-type: none"> <li>Provide incentives to reduce nutrient inputs and to convert cesspools to septic tanks</li> </ul>	Counties	New
<ul style="list-style-type: none"> <li>Provide temporary pump-out facilities, such as pump trucks and encourage boaters to use them while permanent pump-out facilities are constructed for recreational boat and commercial harbors</li> </ul>	DLNR, DOT, HCDA	Ongoing
<ul style="list-style-type: none"> <li>Provide adequate solid waste management facilities for recreational boat harbors</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Increase the frequency of inspection of marine sanitation devices for commercial and recreational vessels</li> </ul>	USCG	Ongoing
<ul style="list-style-type: none"> <li>Increase user fees for recreational marine facilities to pay for environmental management systems</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Increase user fees for infrastructure improvements and maintenance</li> </ul>	DOT/DLNR	New in 2006
<ul style="list-style-type: none"> <li>Ensure the State's commercial harbor system meets existing and future needs for maritime commerce in an environmentally and economically sustainable manner</li> </ul>	DOT	Ongoing

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Strategies, Actions, and Sub-Actions	Lead	Status
<b>Strategy 2.2: Improve the health of coastal and ocean resources for sustainable traditional, subsistence, recreational, and commercial uses</b>		
<b>Action 9: Strengthen and expand marine protected area management and conservation, develop ecosystem-based approaches for nearshore fisheries management, and establish and institutionalize approaches for restoration of ancient Hawaiian coastal fishponds and salt ponds.</b>		
<ul style="list-style-type: none"> <li>Develop and implement a marine protected area policy framework that allows for management by agencies, communities, and appropriate nonprofit organizations</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Conduct a public process, including public meetings, to seek additional input into the marine protected area management framework, with significant stakeholder participation</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Conduct carrying-capacity analyses for priority marine protected areas and identify limits of acceptable change with local stakeholder involvement</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Develop place-based marine protected area plans for priority areas</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Identify and implement priority management measures to minimize recreational and commercial overfishing and habitat destruction, including restriction on harmful fishing gear and practices</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Identify, protect, and restore essential fish habitat for nearshore fish stocks, including marine and estuarine habitats</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Develop and promote public- and private-sector hatchery culture and release programs to increase standing stock biomass of economically important reef and ocean species</li> </ul>	DOA, DLNR	Ongoing
<ul style="list-style-type: none"> <li>Develop and implement a strategic research and monitoring agenda to improve management decision-making</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Develop a streamlined permitting process that allows individuals and coastal communities the opportunity to restore and operate ancient Hawaiian coastal fishponds</li> </ul>	DLNR, DOA, OHA, DOH, SOEST, NGOs	Ongoing
<ul style="list-style-type: none"> <li>Develop and implement a cultural education curriculum constructed around the ancient Hawaiian fishponds and respect for traditional practices</li> </ul>	SOEST, DOE, OHA, NGOs	Ongoing
<ul style="list-style-type: none"> <li>Establish and institutionalize approaches for restoring, operating, and preserving ancient Hawaiian coastal fishponds and salt ponds for the benefit of coastal communities</li> </ul>	OHA, DLNR	Ongoing
<ul style="list-style-type: none"> <li>Conduct education and outreach campaigns on underlying rationale for existing rules and regulations related to ocean resource use</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Increase the presence of conservation and resources enforcement officers and natural resource rangers to increase educational opportunities, deter infractions, and improve compliance</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Employ community-based partnership programs, including the Mauka-Makai Watch Program</li> </ul>	DLNR, Community Volunteers	Ongoing
<ul style="list-style-type: none"> <li>Improve enforcement capabilities through the use of administrative and civil penalties</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Develop public outreach, education materials and interpreter training for appropriate interaction with protected species</li> </ul>	DLNR	Ongoing

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<b>Strategies, Actions, and Sub-Actions</b>	<b>Lead</b>	<b>Status</b>
<ul style="list-style-type: none"> <li>Develop recreational management areas for waters with high tour vessel activity to limit overall impacts to protected species</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Develop a framework to manage and protect anchialine ponds; Incorporate information on location of anchialine ponds into parcel information and integrate protection measures into SMA permits</li> </ul>	DLNR	New
<ul style="list-style-type: none"> <li>Amend interim stream flow standards to ensure protection and enhancement of stream environments as they effect coastal communities.</li> </ul>	DLNR	New
<b>Strategy 2.3: Establish sustainable commercial aquaculture in coastal areas and ocean waters to diversify and expand Hawai'i's economy and to provide locally produced sources of seafood.</b>		
<ul style="list-style-type: none"> <li>Promote ecosystem-based fisheries management</li> </ul>	DLNR,	Ongoing
<b>Strategy 2.4: Enhance public access and appropriate coastal dependent uses of the shoreline</b>		
<b>Action 10: Establish, enhance, and restore public access to the shoreline and scenic vistas</b>		
<ul style="list-style-type: none"> <li>Develop enhancement and restoration plans to increase public access and restore priority beaches and scenic vistas</li> </ul>	DLNR, Counties	Ongoing
<ul style="list-style-type: none"> <li>Establish funding priorities for priority beach restoration projects.</li> </ul>	DLNR, Counties	Ongoing
<ul style="list-style-type: none"> <li>Develop interagency agreements and public-private partnerships to implement enhancement plans</li> </ul>	DLNR, Counties	New in 2006
<ul style="list-style-type: none"> <li>Implement shoreline enhancement and restoration plans in priority areas</li> </ul>	DLNR, Counties, Landowners	New in 2006
<ul style="list-style-type: none"> <li>Develop public education programs to build stewardship ethic toward the coastline and ocean</li> </ul>	DLNR, OP, MACZAC	Ongoing
<ul style="list-style-type: none"> <li>Identify and implement innovative mechanisms for coastal land acquisition and funding as an effective measure to preserve beaches and other coastal assets</li> </ul>	DLNR, Counties	New in 2006
<ul style="list-style-type: none"> <li>Conduct an inventory of beaches, shoreline areas and scenic vistas requiring protection as open space</li> </ul>	DLNR, Counties, SOEST	Ongoing
<ul style="list-style-type: none"> <li>Develop interagency agreements and public-private partnerships to acquire, preserve, and restore priority watershed areas</li> </ul>	DLNR, Counties	New in 2006
<ul style="list-style-type: none"> <li>Establish criteria for identifying priority coastal areas for public acquisition and appropriate coastal dependent uses</li> </ul>	DLNR, Counties, SOEST	New in 2006
<ul style="list-style-type: none"> <li>Establish new beach and shoreline areas, and scenic vistas as open space for public access</li> </ul>	DLNR, Counties	Expansion
<b>Strategy 2.5: Promote appropriate and responsible ocean recreation and tourism that provide culturally informed and environmentally sustainable uses for visitors and residents</b>		
<b>Action 11: Develop community-based frameworks and practices for identifying and mitigating ocean recreational use conflicts</b>		
<ul style="list-style-type: none"> <li>Conduct a baseline study of ocean recreation and tourism, building on existing information and data, that focuses on user conflict and potential impacts from threats to the ocean environment</li> </ul>	DLNR, OP, Industry, Community	New in 2006

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<b>Strategies, Actions, and Sub-Actions</b>	<b>Lead</b>	<b>Status</b>
<ul style="list-style-type: none"> <li>Work with existing groups or form new advisory groups to develop tools for resource protection and conflict management</li> </ul>	DLNR, Community	Ongoing
<ul style="list-style-type: none"> <li>Work with active stakeholder involvement in targeted areas to mitigate cultural, environmental, and resource use conflict</li> </ul>	DLNR, Community	New in 2006
<ul style="list-style-type: none"> <li>Encourage community-based, culturally informed environmental education and outreach programs promoting responsible ocean recreation</li> </ul>	DLNR, Community	New in 2006
<ul style="list-style-type: none"> <li>Develop and amend Ocean Recreation Management Area rules as tools to avoid and/or mitigate ocean recreation user conflicts and to address capacity issues</li> </ul>	DLNR	Ongoing
<ul style="list-style-type: none"> <li>Establish performance standards to ensure responsible commercial ocean-based tourism</li> </ul>	DLNR, DBEDT, Industry	New in 2006
<ul style="list-style-type: none"> <li>Establish and enforce ecotourism-related permit systems to protect the resources and visitor experience</li> </ul>	DLNR, DBEDT	New in 2006
<ul style="list-style-type: none"> <li>Encourage the integration of best management practices and cultural values and experiences into commercial ocean-based tourism business plans</li> </ul>	DLNR, Industry	New in 2006
<ul style="list-style-type: none"> <li>Establish an appropriate growth policy on ocean tourism considering the carrying capacity and levels of acceptable change of the resource, quality of the experience, and visitor satisfaction, and ensuring access to the marine environment by residents is not compromised</li> </ul>	DLNR, DBEDT, Industry	New in 2006
<ul style="list-style-type: none"> <li>Use concession agreements as a management tool to mitigate ocean recreation user conflicts on priority issues such as surf instruction, kayaking, snorkel and diving, and related operations in areas where conflicts are occurring or could occur</li> </ul>	DLNR	Ongoing
<b>Strategy 2.6: Encourage cutting edge and appropriate ocean science and technology with safeguards for ocean resource protection</b>		
<b>Action 12: Promote alternative ocean energy sources and expand ocean science and technology</b>		
<ul style="list-style-type: none"> <li>Conduct a feasibility study for demonstration and scale-up of appropriate ocean energy technologies for Hawai'i</li> </ul>	DBEDT, Universities, Industry	Ongoing
<ul style="list-style-type: none"> <li>Conduct analyses of the impacts of ocean and non-ocean-related energy alternatives on ocean health</li> </ul>	DBEDT, UH, Industry	Ongoing
<ul style="list-style-type: none"> <li>Develop a streamlined, one-stop approach to permitting coastal and ocean aquaculture projects that includes guidelines for sustainable operations that ensures the conservation of ocean and coastal ecosystems</li> </ul>	DBEDT, DOA, DLNR	New
<ul style="list-style-type: none"> <li>Establish a Geographic Information System (GIS)-based site identification database to locate coastal and ocean aquaculture projects in environmentally suitable sites</li> </ul>	DBEDT, DOA, DLNR	New
<ul style="list-style-type: none"> <li>Provide State financial incentives to landowners and investors to encourage their participation in commercial aquaculture development</li> </ul>	DBEDT, DOA	New
<ul style="list-style-type: none"> <li>Provide a supportive business and cost environment for sustainable commercial aquaculture through the establishment of public and private-public land-based and ocean aquaculture parks</li> </ul>	DLNR, DOA, DBEDT	New

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Strategies, Actions, and Sub-Actions	Lead	Status
<ul style="list-style-type: none"> <li>Facilitate appropriate research and innovation in energy, ocean leasing, and other marine technologies and ocean uses</li> </ul>	DBEDT, SOEST	Ongoing
<ul style="list-style-type: none"> <li>Develop and promote Hawai'i as a learning destination for ocean science, technology, and management applications in the Pacific and globally</li> </ul>	DBEDT, SOEST	Ongoing

**PERSPECTIVE THREE: PROMOTING COLLABORATIVE GOVERNANCE AND STEWARDSHIP: *Working together and sharing knowledge, experience, and resources will improve and sustain our efforts to care for the land and sea.***

Strategies, Actions, and Sub-Actions	Lead	Status
<b>Strategy 3.1: Apply integrated and place-based approaches to the management of natural and cultural resources</b>		
<b>Action 13: Support community-based natural resource restoration, including, where appropriate, ahupua'a management</b>		
<b>Action 14: Develop integrated natural and cultural resource planning processes and tools while building capacity for community participation in natural and cultural resources management</b>		
<ul style="list-style-type: none"> <li>Facilitate integrated natural resource management in demonstration <i>ahupua'a</i> and <i>moku</i> through 'Aha Moku Council</li> </ul>	DLNR	Revised wording
<ul style="list-style-type: none"> <li>Where appropriate, establish a <i>moku</i> support network to increase community dialogue, develop a framework for education, and build partnerships among various stakeholders</li> </ul>	DLNR,	Revised wording
<ul style="list-style-type: none"> <li>Develop an integrated geographic information system for priority watersheds and coastal areas</li> </ul>	OP	Ongoing
<ul style="list-style-type: none"> <li>Develop education and outreach programs through interagency agreements and in partnership with community groups and relevant nonprofit organizations to educate residents and visitors on natural and cultural resource values, regulations, and best practices</li> </ul>	OP, DLNR, MACZAC	New in 2006
<ul style="list-style-type: none"> <li>Identify existing networks, community groups and organizations to work with to establish responsible management entities to implement the ORMP</li> </ul>	OP, Counties, Community Groups	Revised wording
<ul style="list-style-type: none"> <li>Develop mechanisms and streamlined permitting processes to support community-based natural resource restoration and other activities designed to benefit ecosystem management</li> </ul>	TBD	Revised wording
<ul style="list-style-type: none"> <li>Undertake and coordinate outreach and educational efforts, with community input, to raise awareness of program efforts to develop integrated planning approach</li> </ul>	OP, MACZAC	Revised wording
<ul style="list-style-type: none"> <li>Expand the Mauka-Makai Watch program and provide standardized training programs and guidelines for participating community volunteers and organizations</li> </ul>	DLNR	Ongoing
<b>Strategy 3.2: Implementation, evaluation, and reporting</b>		
<b>Action 15: Integrate with National Ocean Policy</b>		
<ul style="list-style-type: none"> <li>Assist in the formation of the Pacific Regional Ocean Partnership</li> </ul>	OP	New
<ul style="list-style-type: none"> <li>Develop capacity for coastal and marine spatial planning</li> </ul>	OP	New
<b>Action 16: Develop legislative and administrative proposals to improve management of natural resources</b>		
<ul style="list-style-type: none"> <li>Work with the 'Aha Moku Advisory Committee on a framework for wider implementation of ahupua'a principles</li> </ul>	DLNR	New in 2006
<ul style="list-style-type: none"> <li>Where needed, propose legislation for statutory changes to the Hawai'i CZM program network, including SMA permits and possibly other regulatory programs</li> </ul>	OP-CZM	Revised wording
<ul style="list-style-type: none"> <li>Advocate for changes to State statutes, State and county rules, or administrative policies to support within the CZM program to support ecosystem management within</li> </ul>	OP-CZM, MACZAC	Revised wording
<b>Action 17: Monitor and evaluate Ocean Resource Management Plan implementation</b>		

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<b>Strategies, Actions, and Sub-Actions</b>	<b>Lead</b>	<b>Status</b>
<ul style="list-style-type: none"> <li>Identify benchmarks and milestones</li> </ul>	OP	New
<ul style="list-style-type: none"> <li>Prepare an annual report</li> </ul>	OP	Ongoing
<ul style="list-style-type: none"> <li>Establish multisectoral ORMP implementation and monitoring group</li> </ul>	OP	New
<ul style="list-style-type: none"> <li>Develop environmental health curriculum for State Agency staff</li> </ul>	OP	New
<ul style="list-style-type: none"> <li>Conduct ORMP monitoring and evaluation Policy Group and Working Group</li> </ul>	OP	Revised wording
<ul style="list-style-type: none"> <li>Adjust strategic actions as needed based on monitoring and evaluation</li> </ul>	OP	New in 2006
<ul style="list-style-type: none"> <li>Conduct biennial ORMP strategic planning session</li> </ul>	OP	Revised wording
<ul style="list-style-type: none"> <li>Conduct 5-year review and update of the ORMP</li> </ul>	OP	Ongoing
<ul style="list-style-type: none"> <li>Incorporate experiences and lessons learned into legal and administrative reforms</li> </ul>	OP	Ongoing