

# Maui Marine Protected Areas Recreational Management Analysis

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Prepared by: Jill Komoto, dba Summit to Sea Conservation  
Hilo, Hawaii





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# INTRODUCTION

## Overview of the Planning Process

In 2005, the Coral Reef Alliance held several workshops to help foster stewardship of Honolulu-Mokulē'ia Bay and Molokini Shoal Marine Life Conservation Districts. During CORAL's standardized *Sustainable Marine Recreation* workshops, participants representing a diversity of stakeholder groups were first asked to identify threats to each site; then propose solutions to help alleviate each threat. In a follow-up *Conservation in Action* workshop in 2006, groups were formed to develop stewardship projects addressing one of the key threats; each group submitted a micro-grant proposal to CORAL for funding, up to \$5,000 each.

In 2008, CORAL received a grant to conduct a recreational Marine Protected Area (MPA) analysis for two Marine Life Conservation Districts (MLCDs) on Maui, Honolulu-Mokulē'ia Bay and Molokini Shoal. Notes from previous meetings related to marine managed areas were analyzed and utilized for the report. These meetings included: CORAL's *Sustainable Marine Recreation* workshops in 2005; Legislature/Department of Land and Natural Resources-Division of Aquatic Resources (DLNR-DAR) marine managed meetings in 2005; focus group meetings used to develop a Marine Managed Area (MMA) framework; local community planning meetings; Comprehensive Wildlife Conservation Strategy (DLNR-DOFAW); and Hawaii Coral Strategy interviews. Individual meetings were also conducted with key management agency representatives and community members.

In addition, an online/email survey was conducted to obtain Maui MLCD stakeholder input; 17 people responded. Survey respondents were asked to rank threats (from previous workshops) to Molokini and Honolulu Bay with regards to three categories: 1) Area portion of coral reef that the threat will affect; 2) Intensity-impact or severity caused by the threat; and 3) Urgency-is it a current threat or will it occur 25 years from now? Then respondents were asked to rank the threats against each other. Other questions related to:

- Potential solutions and community-based projects to address threats
- Management actions needed to address threats
- Obstacles to success

Overall, for Molokini, respondents ranked the biggest threats as: recreation impacts, capacity issues, and contact of the reef/handling of marine animals. For Honolulu, the highest ranked threat was land-based pollution by a large margin, followed by fisheries management/poaching. Human contact (recreational misuse/overuse) was individually highly ranked in area, intensity and urgency. Anchor damage at Honolulu was thought to have a large impact as well.

## Management Goal & Objectives

The goal of this project is to incorporate marine recreation stakeholder feedback, concerns, and realities into a recreational management analysis, which can inform

future management plans and projects supportive of the Honolua-Mokulē'ia Bay Marine Life Conservation District and Molokini Shoal Marine Life Conservation Districts.

To achieve this goal, a marine protected area's gap analysis for the two Marine Life Conservation Districts on Maui will be conducted that will assist in: 1) informing the state in the management planning process, and 2) recommending community-driven micro-grant projects that CORAL can suggest and support through its ongoing *Conservation in Action* workshops.

## **BACKGROUND INFORMATION**

### **Description of Honolua-Mokulē‘ia Marine Life Conservation District**

(adapted from “Honolua Bay Review: A review and analysis of available marine, terrestrial and land-use information in the Honolua Ahupua‘a Maui 1970–2007” by Chaston, K. and Oberding, T. and “Recreational Carrying Capacity Evaluation of Honolua Bay, July 2007” by Courtney, C.)

#### **Size and Location**

Honolua Bay is located on the northwestern coast of Maui, about 10 miles north of Lahaina along Honoapi‘ilani Highway (Hwy 30). Mokulē‘ia Bay is southwest of and adjacent to Honolua Bay. The MLCD covers an area of 45 acres of coral reef habitat and extends from the highwater mark seaward to a line from ‘Alaelae Point to Kalaepiha Point, then to the point at the northwestern corner of Honolua Bay. The Honolua Bay portion of the MLCD covers an area of approximately 26.5 acres or 107,242 square meters. The rocky beach at Honolua Bay is about a third of an acre, or 1,552 square meters. The bay is also included within the boundaries of the Hawaiian Islands Humpback Whale National Marine Sanctuary, approved by the U.S. Congress in 1997 (Courtney, 2007).

The MLCD is part of the Honolua watershed, which covers approximately 3,028 acres or 4.7 square miles and includes the drainage area of Honolua Stream, Papua Gulch, and Pahiki Gulch (Chaston, 2007; United States Environmental Protection Agency et al. 2004).

#### **Marine Benthic Habitat**

Honolua Bay can be divided into three broad regions. The region includes: a fringing reef extending into the bay and bordering the north and south shorelines, a deeper sandy bottom area between the reefs, and an inner area of silt, sand, and a boulder bottom extending across the inner bay, offshore from the sand and cobble beach at the head of the bay.

The central sandy region is composed of well sorted sands of both terrestrial and biogenic origin (calcareous material). The percentage of terrestrial basaltic sands and silt content decreases from shore.

#### **Coral Reef Resources**

Many studies on the ecology and biology of the coral reef ecosystems have been conducted over the past 33 years at Honolua Bay; see the report by Chaston and Oberding for an overview.

A key study conducted by Friedlander et al (2006) looked at the effectiveness of Hawaii’s MPAs and fish habitat utilization patterns as compared to open areas. One study area included the Honolua-Mokulē‘ia Bay MLCD from Kapalua Bay north to

Honolua Bay. A total of 100 samples were collected between July 2 and August 22, 2002. Using digitized benthic habitat maps with in-water monitoring, the study found:

- The most abundant substrate type was turf algae (41%) and sand/silt (35%). This was similar to the open access areas.
- Total coral cover was higher in the MLCD (12%) than in the open area (8%), due to higher percent cover of *Porites lobata* in the MLCD.
- Fish assemblage characteristics (species richness, biomass, and diversity) were higher in the MLCD compared to the open area over all habitat types. The highest value was in the colonized hard bottom habitat. Biomass was almost twice as high in the MLCD as compared to the open areas.
- Herbivores were the most dominant trophic type by weight over all habitat types with 61% of the total fish biomass, followed by secondary consumers (36%), and apex predators (3%). Even though apex predators biomass was low, it was still 10 times greater in the MLCD than in the open area.

The most recent report on monitoring completed by Coral Reef Assessment and Monitoring Program (CRAMP) and DLNR-DAR (1999-2007) indicates that coral cover declined from 42% to 9% at the MLCD.

### **Wildlife Resources**

Green sea turtles are seen frequently in the bay, especially in the northern portion. Tiger, white tip and black tip sharks have also been spotted in the bay; in 2005 tiger and black tip sharks were seen feasting on dead akule and the beach was closed for nearly a week.

According to the report by Chaston, the only known mammal survey was conducted by Baird et al. (2000) in the form of a preliminary summary of a 1999 odontocete (toothed whale) population survey of the main Hawaiian islands. The researchers observed odontocetes in the waters from Lana'i, Maui to Kaho'olawe (including Honolua Bay) for 80 days and had a total of 124 encounters including: 47 spinner dolphin groups; 35 bottlenose dolphins groups, 34 pantropical spotted dolphins groups, six false killer whale groups, and one pygmy killer whale group (Chaston and Oberding 2007).

### **Cultural Resources**

The Honolua watershed is in the traditional Hawaiian land division of Honolua Ahupua'a, and within the traditional cultural district (moku) for Ka'anapali. Honolua Valley is one of five valleys in the former Ka'anapali district that drain the western slopes of West Maui. "In traditional Hawaiian times, the five valleys provided West Maui with rich, substantial lands amenable to the construction and use of large agricultural systems. Hawaiians in the area developed extensive irrigated taro terraces (lo'i) and drainage systems ('auwai) that supported a large population. Inland resources such as taro, sweet potatoes, etc. were brought to Ali'i residences at the coast from nearby plantations. Extensive cultivation of dry land taro and sweet potatoes, supplemented by coastal fishing, supported a sizeable ancient Hawaiian population. Throughout all of Hawaii, coastal lands were utilized for chiefly residences and Honolua was no different.

Oceanfront areas provided easily accessible resources such as elaborate offshore and onshore fish ponds as open ocean, or deep-water fishing” (SCS, 2006).

Honolua Bay is one of the 6 famous Hono a Pi'ilani, or the bays acquired by Chief Pi'ilani. It also is significant for Hawaiian Canoe Voyaging and was the departure point for the Hokule'a voyaging canoe's maiden voyage to Tahiti in 1976.

Several archaeological and historical sites were identified by Bishop Museum staff in 1974 and re-surveyed by Scientific Consultant Service Inc. (SCS) in 2006. Thirteen sites have been identified in Honolua including two Heiau, boulders with grinding surfaces, house platforms/burial mounds, agricultural terraces/houses platforms, and midden. All sites were assessed as being historically significant under Criteria D (site has yielded or has the potential to yield information important in prehistory or history) and are being preserved and monitored.

## **Description of Molokini Marine Life Conservation District**

### **Size and Location**

Molokini Islet is a crescent shaped tuff cone formed approximately 150,000 years ago. It lies more than two miles off the southwest shore of Maui. The 22.4 acre islet is steep sided and rises to a height of 162 feet. The land mass is a narrow half-circular strip to the south that is open to the north and forms a relatively calm and shallow area within.

The Molokini Marine Life Conservation District encompasses a total of 200 acres divided into two sub zones: A and B. Sub zone A is defined as the submerged lands and overlying waters within the crater. Sub zone B is the area that extends out 100 yards from the semicircle formed by the islet (Severns and Fiene, 2003).

### **Geological Resources**

The islet is the top of a cinder cone that was formed by a flank eruption on Haleakala when the sea level was much lower than today. It is believed that the lower, submerged portion of the crater is the result of trade winds pushing material to the south creating an uneven height on the round shaped crater. Later, as sea levels have risen, the northern section became covered with water.

### **Marine Benthic Habitat**

The outer wall of Molokini forms a steep, occasionally vertical, drop-off into deep rough ocean waters where strong currents are common. The strong currents and wave action bring in a large amount of nutrients in the form of plankton and organic matter washed off the wall by wave action. Only a few species of coral are able to withstand the rough waters, and fish and crustacean species using the wall as their home also have pelagic predators to contend with.

The inner wall is more protected than the south facing outer wall and thus able to support a larger array of organisms in its benthic habitat; however it too occasionally gets battered by large surf and storms. The relatively calm waters allow for a wide range of corals to grow, but occasional storms can cause extensive damage by ripping loose

algae as well as killing or breaking corals and rolling rocks around. This allows for other opportunistic corals and algae to grow.

The central reef area, or the large area within the semicircle formed by the islet, is the most stable benthic habitat in the preserve. Since it is deeper than the inner wall area, it is not as affected by the periodic storms. Friedlander et al (2006) found that the most abundant substrate types were turf algae (41%) and sand (29%).

### **Coral Reef Resources**

The outer wall contains a few species of hardy corals including orange cup coral, white soft coral as well as black coral which is found in deep water and thus less affected by storm surf. From the late 1950's until 1977 when Molokini became protected, commercial divers nearly wiped out the population of black coral. Since then, colonies of black coral have slowly begun to rebound although they haven't reached their prior levels. Similar to corals in feeding strategy and habitat, red sponges also populate the outer wall.

The inner wall has the most diversity of corals with it being dominated by cauliflower coral that is most resilient to the occasional storm.

The central reef was measured to have a 74% coral cover in a 2006 DAR (Division of Aquatic Resources) study. This is one of the highest values for percent cover anywhere in the state. The central reef area is dominated by the coral families of *Poritidae* and *Montipora*; Friedlander et al (2006) calculated the predominant corals as *Montipora patula* (9%), *Porites lobata* (8%), *M. capitata* (6%), and *Pocillopora meandrina* (5%).

### **Wildlife Resources**

Seabird colonies are found on the islet itself, while pelagic fish and whales cruise the outer borders of the reserve. Species such as turtles, whale sharks, predatory sharks, the Hawaiian monk seal and humpback whales have all been spotted within the MLCD.

The main bird populations are Shearwaters and Petrels, which nest on the islet along with Boobies and Frigatebirds which frequent the islet but do not nest there.

In a 1998 study by CRAMP (Coral Reef Assessment & Monitoring Program), 98 species of fish were counted within the central area. It was noted in this study that coral eaters and detritus eaters were the most common in the central area, whereas plankton eaters were the most common along the west edge of the inner crater, which is more open to currents bringing in the plankton. Friedlander et al (2006) found that herbivores account for 42% of total fish biomass, followed by apex predators (41%), and secondary consumers (17%). Dominant species included a mix of surgeon fish, trigger fish, sharks, jacks and parrot fish. A number of important resource species were also found, including blue trevally (*omilu*), giant trevally (*ulua*), and big eye emperor (*mu*).

### **Cultural Resources**

Legends regarding how Molokini islet was formed have connections to all of the four major gods of Hawaii: Ku, Kane, Kanaloa and Lono.

Native Hawaiians utilized Molokini as a fishing area and perhaps for birding as well. Along the inner rim of the crater, stone sinkers, shaped like a small bread loaf were found attached to several types of nets from the bark of a native shrub. Other sinker stones, shaped like a coffee bean the size of one's palm, have been found, which were once part of octopus lures called leho he'e. Stones found on the bottom of the outer rim were used for palu fishing, which takes advantage of the strong current that runs along the outer slopes.

## **Maui MLCD Recreation Use**

### **Recreational Tourism in Hawaii**

#### *Value of Marine Managed Areas*

A study by van Beukering and Cesar (2004) estimated the economic value of Marine Managed Areas (MMAs) in Hawaii and evaluated the costs and benefits associated with various management and financing regimes of those MMAs. Two of the sites they evaluated included Molokini and Honolulu-Mokulē'ia Bay MLCDs.

Two questions were asked: 1) What is the economic value of different types of MMA management? and 2) Is it worth protecting the reefs? Do benefits exceed the costs? Researchers estimated the recreational benefits for each site, including an allocation of recreational benefits between divers and snorkelers. For the year 2003, it was estimated that Molokini provided almost 20 million in recreational benefits; Honolulu Bay 2.6 million.

Finally, various management scenarios were investigated for each site, based on observations and interviews. Improvements in management included: 1) Services (basic facilities such as restrooms, showers and waste-bins); 2) Enforcement/compliance; 3) Education/awareness; 4) Assessment/monitoring; and 5) Infrastructure.

For Molokini, the management scenario included:

- Enforcement measures to decrease poaching;
- Education/awareness on boats through training/certification; and
- Maintenance of day use mooring buoys.

For Honolulu, the management scenario included:

- Enforcement measures to decrease poaching;
- Education/awareness (note that this study was conducted prior to Honolulu Bay being officially established as a Makai Watch site);
- Installation of day use mooring buoys; and
- Establishment of basic restroom and shower facilities along with a short pier for easier and safer access to the water.

The researchers then estimated the present value of the costs of management improvements spread out over 25 years (net present value). To estimate the net present

value of the benefits over 25 years, they included three components: recreational value, fishery value, and educational spillover value. Fishery value includes spillover effects to adjacent areas and larval spillover. Educational spillover assumes that if a diver or a snorkeler is properly instructed and educated at one site, they will behave better at other sites.

The study concluded that without additional management at Molokini, there would be a decline in overall benefits. Additional management measures limit the amount of benefits over time at Molokini, since management measures have already been achieved in the past. Benefits from additional measures at Honolua would steadily grow over 25 years. Finally, using a cost benefit analysis, a break-even user fee was calculated (charge per user at which management costs can be paid for by a user fee). For Molokini, the fee is \$0.51 per visitor; Honolua the fee is \$1.24 per visitor.

### *Economic Contribution of Whale Watching*

This report quantified the economic impact of commercial whale watching and other humpback whale-related ocean touring in Hawaii, as well as quantifying the broader economic impact of the ocean tour boat industry. In February to July of 1999, a survey was conducted of ocean tour boat operators and passengers. Here is a summary of the overall findings:

- Direct revenues attributable to whale watching were \$11-\$16 million during the 1999 whale season. The low end of this range is an estimate of direct revenues generated by commercial whale watching tours, while the upper end includes \$5 million generated by snorkeling trips. Many snorkelers take trips in hopes of seeing whales as well.
- The total economic impact of whale watching in 1999 was \$19-\$27 million. These figures include direct, indirect and induced revenues. Direct revenues are the dollars spent on ocean tours and does not end with the operators and intermediaries. Indirect revenues are those spent by operators to run their businesses, such as purchasing fuel, food, and snorkeling equipment. Induced revenues are those spent within Hawaii by employees of operators and intermediaries as a portion of their wages.
- For Maui in 1999, whale watching provided \$6.1 million (\$10.5 million indirect revenues); snorkeling tours \$39.5 million (\$67.5 million indirect); dinner cruises \$5.1 million (\$8.7 million indirect); sunset cruises \$1.8 million (\$8.7 million indirect). Totals for ocean tours on Maui: \$52.5 million direct; \$89.8 million indirect and 1,290 jobs.

### *The Hawaii Boat Industry 2003 –A Survey and Economic Description*

The 2003 study conducted by M. Markrich on the Hawaii boat industry included a variety of tour boats and activities: parasailing, submarines, snorkel cruises, scuba diving shops that own or contract dive boats, charter fishing, beach catamarans, sightseeing boats (i.e. whale watching), jet-skiing, glass bottom boats and dinner cruises.

A survey was conducted on the telephone and in-person. In 2003, the Hawaii tour boat industry most of these small businesses, generated about \$184 million in gross revenue annually and employed more than 2,000 people. To estimate the ripple effect of the industry on related linkages that exist between operators and their suppliers of material, food, insurance and professional services, multipliers were used. Based on the gross revenue numbers the industry generates, it was estimated that the total economic impact on the economy from the state tour boat industry is \$358,742,500.

#### Maui Tour Boat Industry Figures:

- Number of people employed in the industry: 795
- Employee payroll: \$20,101,338
- Gross Revenues according to survey: \$70,751,816
- Number of tour boat passengers carried in 2003: 1,114,822 (This is approximately half of the 2,131,904 visitors who arrive on Maui annually.)
- Charitable contributions: \$602,800

As a part of this study, Maui operators were interviewed with regards to their concerns which included:

- Long term viability of their business
- Opening up day use moorings for permitted, exclusive use.
- Lack of upgrades at Maalaea and Lahaina harbors.
- No adequate haul-out facility for large vessels.
- High commissions to activity desks to attract tourist customers greatly impact tour boat profit.
- More people staying in timeshares, with repeat visitors requesting kama'aina benefits.

## **Historical and Cultural Recreational Use**

### ***Honolua-Mokulē'ia Bay MLCD***

Historic use of Honolua Bay included surfing as well as the holua slide. In 1884, instead of sailing by canoe, Chief Kihapiilani rode a long surfboard from Honolua to Waialua, Molokai. It was also thought that there was an ancient holua slide, which was used to cross a hilly part at Honolua, now the West Maui Gold Links. Sections of the Kihapiilani trail, paved with beach rocks with a width of four to six feet, can be seen from Honolua to Honokohau and Kahakuloa (Sterling, E 1998).

## ***Molokini Shoal Marine Life Conservation District***

### *Historical Recreational Use*

In 1974, three businessmen started a company called Ocean Activities Center, operating a beach concession from the Mana Kai Hotel in Kihei. They taught scuba from the beach and took classes out on a boat from Maalaea Harbor. Since diving was not so good in the afternoons, they bought a six-passenger catamaran and began offering rides.

The catamaran rides began as short trips around Molokini Crater and then back to shore. Soon customers asked to spend time inside the crater; and soon the snorkel business began. At this time, the catamaran brought bread to feed the fish and attract them closer to the boat. Fish feeding soon became common-place (Project Aware, 2005).

In 1981, only five commercial tour boats regularly conducted tours to Molokini; observations from July 1985 to November 1986 showed an average of 15-25 boats per day with a range from five to 31 boats. The boats ranged in size from 21 to 92 feet long and carried from six to 165 persons each.

In 1994, DLNR-DAR decided to limit the carrying capacity of Molokini MLCD. Existing commercial operators were given one year to show that they used Molokini a minimum of eight times during the previous year. Some new businesses formed and the new and existing businesses were given permits. Some existing businesses chose not to apply for a permit. Maximum number of permits allowed was capped at 42.

In 1996, the University of Hawaii Sea Grant completed a mooring use report for the Department of Business, Economic Development & Tourism (DBEDT) which included a database of existing sites; forms for maintenance and installation; forms for recording sightings of threatened and endangered species; and recommendations to work with dive companies to record underwater survey data and submit a summary report of data collected. Molokini was the only Maui site monitored; and only one company turned in a report, showing an average of four divers and 28 snorkelers per day in September and October, 1996 (University of Hawaii, 1996).

### Recommendations Included:

- Better identification of new moorings and tracking the maintenance of existing moorings;
- Securing better cooperation from tour operators;
- Focusing on high use areas and areas being biologically monitored;
- A need for Division of Boating and Ocean Recreation (DOBOR) to remind operators of the importance of monitoring and ensure confidentiality of data (and that it is a requirement of the Army Corps Of Engineers (ACOE) permit. Note that this is not a current permit requirement of ACOE.

## **Current Recreational Use**

### ***Honolua-Mokulē'ia Bay MLCD***

(adapted from "Recreational Carrying Capacity Evaluation of Honolua Bay, July 2007 by Courtney, C)

#### *Overview*

Recreational use surveys were conducted in 2005 and 2006 to establish 2006 reference levels for recreational activities in Honolua Bay. Visitors entering Honolua Bay by land are predominantly (93.5 percent) non-residents from the mainland U.S. and a few from other countries. This percentage does not take into account surfers entering the bay from the Lipoa Point access. Honolua Bay supports both commercial and non-commercial recreational uses that enter the bay by land and sea. The primary recreational activities at Honolua Bay are snorkeling, SCUBA diving, and surfing.

Other ocean recreational activities in the bay include kayaking and recreational sailboats; however these activities are limited. The bay may be utilized by sailboats during races as a haven from poor weather conditions. There is at least one sailboat race that starts in Honolua Bay (Honolua to Waikiki). A larger international race starts in Victoria, B.C and ends up near Lahaina.

Land-based recreational activities are limited to picnicking associated with visitors that access the bay from land for snorkeling. The types and duration of recreational activities at Honolua Bay are highly dependent on weather and sea conditions. Snorkeling and beach-going activities are predominant during summer. Surfing activities are predominant during winter. Snorkeling and surfing activities are separated spatially as well as temporally and do not appear to pose any recreational use conflicts.

#### *Snorkeling and SCUBA diving*

The survey conducted during 2006 found that the average hourly number of snorkelers during the summer was 50.7 snorkelers per hour. This would amount to over 400 snorkelers per day, based on an 8-hour day. The maximum number of snorkelers counted at any one time was 111. The average hourly number of SCUBA divers was 1.6 divers per hour; maximum number of divers was 17 divers at any one time.

#### *Surfing*

Surfers access the northern end of Honolua Bay by parking on Lipoa Point and walking down a cliff trail. This access is separated from the parking lot and trail used by snorkelers to access the bay by land. Occasionally, surfers access the bay from the trail used by snorkelers, especially if surf is up on the south side of Honolua Bay. Surf competitions are held twice a year at the northern end of Honolua Bay. Currently, Maui Land & Pineapple Company (ML&P) gives land-based access permits for surf competitions limited to a total of 3 days per year. During a surf competition, access to the surf break called "Cave" is restricted. Access to other surf breaks remains open.

The 2006 average hourly number of surfers ranged from 0.1 surfers in the summer and to a maximum of 72.8 surfers in the winter, with an overall winter average of 25.4 surfers per hour.

### *Commercial Tour Boats*

While the number and capacity of commercial tour boats is not regulated, there are about 10 boats from Ka'anapali regularly visiting Honolua Bay, each permitted to carry a maximum of 49 passengers. Boats usually visit the bay between 0900 and 1400 hours, during the high season from February to April and June to July. The holiday season in November and December can also be a busy time. Most boats carry primarily snorkelers and are mainly catamarans. They typically arrive after 1100 hours and remain in the bay between 1.5 to 2 hours. Since there are no legal moorings (as of this writing), vessels anchor in the bay deploying stern anchors and connecting to lines wrapped around the substrate.

### *Trends*

Honolua Bay has become a popular recreational snorkeling and SCUBA diving site, although the number of visitors has fluctuated somewhat over the last 10 years. Snorkeling and SCUBA diving activity levels, quantified as part of the Courtney study at Honolua Bay, were higher than levels measured in 2002 (Holland and Meyer 2002) but lower than levels measured in 1997 and 1998 (Brown 1999). However, anecdotal documentation from the naturalists stationed at Honolua Bay during the summer months (2007-2009) have reported on numerous occasion 700-800 visitors arriving during six-hour timeframes.

### ***Molokini Shoal MLCD***

There are currently 42 active permits for Molokini MLCD. While the number of boats receiving permits over the last 15 years has been capped at 42, the size of the boats and passenger capacity has increased. In 2003, it was estimated that between 1,500 and 1,800 people visit Molokini per day (assuming 340 days of good weather) (Markrich, 2003). Other estimates include 400,000 per year (Friedlander, 2005). From 1986 to 2009, the weighted average size of the boats visiting Molokini did not increase; however the weighted average number of passengers/crew per boat went up from 59 to 79, an increase of 33%.

### **Formation of the MLCD**

#### ***Honolua-Mokulē'ia Bay MLCD***

The site is unique in its beauty, abundance, and variety of natural marine life; it was evident that its natural marine life was being negatively affected by human activity. Maui County Council Resolution 77-132 requested a study for potential suitability as a Marine Life Conservation District. In 1978, the site was designated a Marine Life Conservation District after the Department of Land and Natural Resources study.

### ***Molokini Shoal MLCD***

After it became apparent that the environment was threatened by increasing consumptive uses, the Marine Life Conservation District designation was requested for

Molokini in the 1976 legislative session by Senate Resolution 446, Senate Concurrent Resolution 110, and House Resolution 625. Molokini became a MLCD on July 7, 1977.

## **From Stewardship to Management**

### ***Honolua-Mokulē'ia Bay MLCD***

Many groups take care of Honolua Bay. These include the State of Hawaii Department of Land and Natural Resources (DLNR), County of Maui, private landowners and local community groups. Their efforts are briefly described below.

#### *Local Action Strategy to Address Land Based Pollution*

In 2002, the US Coral Reef Task Force (USCRTF) identified six management focus areas based on a prioritization of nationwide threats: coral reef fisheries, land-based pollution, and lack of public awareness, recreational use, coral bleaching, and reef organism disease. The State of Hawaii developed six Local Action Strategies (LAS): lack of awareness, aquatic invasive species, coral reef fishery, land-based pollution, recreational impacts, and climate change and marine disease. In 2004, the Honolua Bay ahupua'a was designated as a focal ahupua'a by the LBP LAS committee. Goals, objectives and measures of success were identified, along with specific actions for each focal ahupua'a. To date, the LAS' accomplishments for Honolua Bay include:

- Synthesis and critical analysis of available data and information on land use, runoff, water quality, and the health of coral reef ecosystem at Honolua Bay
- Recreational carrying capacity evaluation of Honolua Bay
- Spatial and temporal variability in historic near-shore sedimentation recorded in coral skeletons
- Study of anthropogenic and natural stresses on coral reefs
- Hawaii coral reef assessment and monitoring program
- Study of long-term variability of currents, temperature, salinity and turbidity off Kahana, Northwest Maui
- West Maui coastal circulation experiment

#### *Makai Watch and Community Efforts*

In 2005, Project S.E.A-Link developed a stewardship program at Honolua Bay, funded by the Division of Aquatic Resources, and subsequently received additional funding from DAR, DBEDT, and the Hawaii Tourism Authority. Efforts supported by grants included an education station at the bay, to educate visitors about the resources of the bay and proper etiquette while in the water, beach cleanups and REEF fish monitoring surveys. In 2007, Honolua Bay was designated officially as a Makai Watch site. The Makai Watch program is a partnership between the Department of Land and Natural Resources (DLNR), and local community groups to train community members to be the "eyes and ears" that look out for their resources. Makai Watch has three components: Awareness/outreach, observation and voluntary compliance, and monitoring.

In 2007, The Save Honolua Coalition came together in response to Maui Land & Pineapple Co.'s announcement of plans to build 40 luxury homes and a golf course on 310 acres above the bay. Public protests over the project led to the company withdrawing its plans before the General Plan Advisory Committee. Another group, the Honolua/Lipoa Point Advisory Council convened around the same time and operated with a similar goal of long-term community-based planning for the Honolua area. In 2008, the groups began a process to work together, with meetings facilitated by the County of Maui to assist in creating a conceptual plan for the Lipoa Point and Honolua Bay area. The two groups, in conjunction with other local groups and agencies, also sponsor ongoing cleanups, other stewardship efforts, and continue to work within the context of community-based management planning.

### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDS***

#### *Coral Reef Alliance Previously-Supported Community Microgrant Projects*

In 2005 and 2006, the Coral Reef Alliance held several workshops to help foster stewardship of Honolua Bay and Molokini Shoal. Threats and solutions were identified and microgrants were given by CORAL to jumpstart some of the proposed solutions. Projects included: coral reef education pilot program on one of the tourism boats; development of a certification card in association with the locally-based Ocean Awareness Training; the purchase of a drill for installing mooring buoys; and the development and field-testing of snorkel bag tags for unguided visitors.

#### *Day Use Mooring Buoys*

(Adapted from Project Aware's *Mooring Buoy Planning Guide*)

In the early 1980s, the Molokini Shoal Marine Life Conservation District had around one to two boats visiting the reef daily. By 1987, over 35 boats, some with capacities for over 100 passengers, were visiting the Molokini MLCDD daily. Anchor damage on the reef was clearly visible from the constant dropping of large anchors and the associated damage caused by chains dragging across the bottom.

Due in a large part to the safety and resource degradation concerns expressed by the commercial operators, the operators worked in concert with the regulatory agencies, to obtain a permit to install both cement blocks as bow moorings and eye bolts as pin stern moorings. The mooring buoys at Molokini are currently the only buoys written into the Hawaii Administrative Rules (13-257-56). The first four legal moorings are awaiting an ACOE permit for Honolua Bay.

### **Benchmarks to Guide Future Management**

#### ***What's Been Done to Help Guide Future Management of Honolua-Mokulē'ia Bay MLCDD***

As one can see, addressing resource management needs at Honolua does not begin with a blank slate. While some of the groups have come together with common goals and worked together with the County and landowner, recreational management of Honolua Bay remains in question.

In 2006, Maui Land and Pineapple hired Tetra Tech with Dr. Catherine Courtney as project manager, to develop a recreational carrying capacity evaluation of the bay. Surveys were conducted for winter use (December 2005) and summer use (July 2006) to establish reference levels for the study. Using this information, along with published studies and research, the recreational carrying capacity of the bay was evaluated. Several scenarios for management of the area were proposed:

- Maintain recreational uses at 2006 levels with improved area management.
- Maintain recreational uses at 2006 levels with improved area management and parking area.
- Maintain recreational uses at 2006 levels with improved area management and supporting infrastructure.
- Revise recreational use activity from 2006 levels based on long-term monitoring of ecological and social conditions.

In 2008, the County of Maui set aside one million dollars to purchase Lipoa Point and preserve it from future development. Unfortunately, as of Spring 2009, the County and Maui, Land & Pineapple, Inc have yet to reach agreement as to other concessions or funds for the property.

In 2008, the Army Corp of Engineers and DLNR-DOFAW began a reconnaissance study of the West Maui Watershed that includes the Honolua Bay watershed. This study was to determine the feasibility of a complete watershed management plan, from ridge top to the reef.

### ***What's Been Done to Help Guide Future Management of Molokini Shoal MLCD***

#### *Designation as a charter site for the National Marine Protected Areas System*

In 2009 the State of Hawaii nominated the Molokini Shoal MLCD and six other sites for inclusion as a charter site in the United States "National Marine Protected Areas System"; it was accepted on April 22, 2009. With this designation comes the potential for access to management resources at a national and possibly international level. As a national MPA partner, other Hawaii MPAs not part of the system can benefit as well with access to tools, technology and new partnering opportunities.

#### *New federal management partner for Molokini Islet*

Currently the islet is managed by DLNR- Division of Forestry and Wildlife with no access allowed. DOFAW is currently holding discussions with the USFWS to co-manage the islet, with the area becoming part of the Kealia National Refuge.

# RECREATION MANAGEMENT

## Recreational Use Issues & Actions

### Public Access

#### *Honolua-Mokulē'ia Bay MLCD*

##### *Management Issues:*

- Access to the bay is limited and can be hazardous due to the lack of safe parking. Erosion along the trail also occurs.
- Access to enter the shoreline area has been restricted by the landowners.

##### *Background Information*

The Hawaii Sustainable Tourism Study, funded by the Hawaii Tourism Authority conducted an assessment of natural resources, including coastal areas and identifies 110 sites around the state that appear to be particularly impacted by visitor usage. The assessment found Honolua Bay MCLD to be a high priority area, with the most immediate need for safe parking. This study also noted other needs of Honolua Bay: no comfort facilities, poorly maintained pathway to the beach, and little signage (directional and interpretive). However the study did note that parking may need to be limited to impacts on the natural resources of the area.

Cars are also allowed within the coastal area by the bay; because of this trail upgrades would be difficult unless vehicles were banned except for times of emergency and for maintenance.

In recent years, entry to the bay has been periodically restricted by another landowner, who requested payment in the form of a donation from those utilizing the area.

##### *Desired outcome:*

Access to the bay is safe and unimpeded, without having to utilize the public road, and the trail is maintained on a regular basis to promote safety and prevent erosion.

##### *Recommended Action(s):*

1. Work with the community, landowner, State Department of Transportation, DOCARE, DAR, and County Police to find a temporary solution to parking.
2. Work with landowners to determine mutually-agreed upon solutions to access issues.
3. Work with community or private contractor to perform necessary maintenance on access road to prevent further erosion.

#### *Molokini Shoal MLCD*

##### *Management Issues:*

- People are not allowed access to the islet as it is a protected bird sanctuary; however there are many requests to use the islet for commercial purposes.

- Recreational boaters who arrive first and hook up to the day use mooring buoys have reported conflict with commercial marine tour operators.

*Background Information:*

Day use mooring buoys are intended to be used on a first come, first serve basis. At Molokini, HAR§13-257-54: Recreational vessel use of Molokini day use moorings states that “Mooring zone “C” is designated for primary use by recreational vessels”.

“Recreational vessels may also use vacant moorings located in zones “A” and “B” except during the period from 8:30 a.m. to 11:30 a.m.

*Desired Outcome:* The islet remains a bird sanctuary with access limited to monitoring and restoration activities only. All boaters are aware of Molokini Day Use Mooring Buoy rules and utilize the buoys appropriately.

*Recommended Action(s):*

1. Continue the no access rule for the islet under USFWS Refuge management.
2. Remind commercial operators about public use of day-use moorings when they apply for permits; make available and distribute the day-use mooring guide developed by the Malama Kai Foundation and the Maui Reef Fund.
3. Educate recreational boaters about the use of buoys at zones A, B and C; outreach can be conducted through various actions such as:
  - a. Posters at marine supply, dive and fishing stores
  - b. Email list serves
  - c. Coast guard boating classes
  - d. Hawaiian Islands Humpback Whale National Marine Sanctuary Boating Classes;
  - e. Ocean Awareness classes

**Social/Ecological Carrying Capacity and Recreational Development**

***Honolua-Mokulē‘ia Bay MLC D***

Management Issues:

- Recreational use at the bay is high during summer months, up to 800 visitors a day (noted during a 6-hour timeframe) with most people accessing the area from the shore.
- The number of visitors to the area will likely increase as land-based and sea-based commercial tour operations respond to increased demand for ocean recreation.

*Background Information:*

The study, “Human Activities in Marine Protected Areas- Impact on Substrates” conducted by Kim Holland and Carl Meyer, looked at the impact of recreational activities (SCUBA diving and snorkeling) on substrates at four Hawaii Marine Life Conservation Districts, including the Honolua-Mokulē‘ia MLC D. The authors determined that the two main factors of human impact on substrates in Hawaii MPAs include the distribution of

recreational activities among MPA sites and composition of benthic assemblages. The majority of substrate contacts by snorkelers occurred along the boulder shoreline where they entered and exited the water. Any increase in the number of SCUBA divers visiting Honolulu Bay is likely to result in higher rates of damage to fragile coral reefs. Bixler McClure, a graduate student at the University of Hawaii-Manoa, completed a master's thesis in the spring of 2009 focusing on SCUBA diver perceptions of crowding at dive sites.

Comments from public meetings on marine managed areas conducted in the last five years indicate a concern about overuse at the bay and the need to allow it to rest.

*Desired Outcomes:*

Access to the bay is limited. Recreation at the bay is kept at sustainable levels.

*Recommended Action(s):*

1. Install permitted day use mooring buoys.
2. Implement Scenario 1 of Courtney's "Recreational Carrying Capacity Evaluation of Honolulu Bay."
3. Maintain parking capacity at its current limit (60 cars).
4. Limit vessel use at Honolulu Bay to day use mooring buoys; ban anchoring in the MLCD.
5. Consider seasonal limitations on use of the bay.

***Molokini Shoal MLCD***

*Management Issue:*

Various sources estimate that between 250,000 – 600,000 people per year may be visiting Molokini MLCD. Most visitations occur in the morning. As many as 30 boats can be seen in the crater at one time. While coral cover has not declined, it is unknown how much effect the larger boats/passenger capacity have on the ecosystem.

*Background Information:* See background information in Section 2 under historical recreation use. There has been recent vessel grounding in the crater due to weather conditions, boat handling, and improper use of the day use mooring buoys.

*Desired Outcome:* Number of people allowed to visit Molokini MLCD is based on ecological carrying capacity, not the number of existing mooring buoys or social carrying capacity.

*Recommended Action(s):*

1. Conduct a carrying capacity study for Molokini MLCD, encompassing both ecological and social carrying capacity.
2. From carrying capacity study outcomes, determine if the existing permit cap is acceptable and/or limit the size of boats (including passenger capacity) allowed at Molokini.
3. ACOE should require the agency requesting the permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota

surveys), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

## **Coral Reef and Associated Habitat Impacts**

### ***Honolua-Mokulē'ia Bay MLCD***

#### *Management Issue:*

Coral reefs and associated habitat are damaged due to both human use at the bay (substrate impacts by visitors and anchor damage) and land-based pollution.

#### *Background Information:*

Coral cover in Honolua Bay has generally decreased since the first surveys were conducted in 1974. In recent years, coral cover has declined dramatically, from 42% (1999) to 9% (2007). Sediments and wave action influence coral cover. High turbidity and sediment deposits in the inner bay have been observed consistently since 1974. Brown (2004) also found that there was low coral recruitment success on the northern reef flat. From the literature review, Chaston (2007) concluded that soil erosion and other sedimentation events have caused coral cover decline, impacted coral recruitment success, and are affecting the long-term condition of Honolua's reefs. *Halimeda kanaloana*, a native green alga (limu or seaweed) that grows in sand between the intertidal and 300 feet deep, is found in the central part of Honolua Bay. Spaulding (2009) found that if the *Halimeda* is removed or severely damaged (such as from an anchor being dropped on it) it takes up to two years to grow back.

#### *Desired Outcome:*

Coral cover improves to pre-1999 levels. *Halimeda kanaloana* meadows are protected from anchor damage.

#### *Recommended Action(s):*

1. Limit recreational use as indicated in the carrying capacity and recreational development issues.
2. Seek funds to conduct an environmental assessment for limited restoration by the bay. Conduct environmental assessment with options for restoration.
3. Develop community workdays to conduct limited maintenance of the trail leading to the bay.
4. The West Maui Watershed Partnership should continue conservation activities to maintain watershed health in the Pu'u Kukui watershed.
5. The County of Maui and MLP should continue discussions with regards to purchase of Lipoa Point and surround area.
6. Continue long term benthic monitoring of Honolua Bay and expand monitoring to include at least one deep site on the reef slope.
7. Begin long term turbidity monitoring.
8. Continue coral recruitment monitoring.
9. Install permitted day use moorings.
10. Divers and snorkelers are given instruction on how to maintain buoyancy (and reasons for) and how to properly use equipment (fitting/adjusting of snorkel, fins and mask) prior to entering the water.

11. Partner with dive shops, hotels and beach concessions that rent snorkeling gear to provide tools and educational strategies with regards to snorkeling etiquette.
12. Partner with hotels to provide presentations on the marine environment to their staff and guests.
13. Partner with marine tour operators to develop a Maui usage guide, to include information specific to Honolua.
14. Provide for floating interpreters in kayaks, snorkeling, or on independent vessels.
15. Contact Maui yacht clubs (Maui Boat and Yacht Club, Lahaina Yacht Club) and provide captains with locations of day use moorings and training on use of moorings.

### ***Molokini Shoal MLCD***

#### *Management Issues:*

- Coral reefs damaged by anchor damage and vessel groundings.
- Coral reefs are damaged by beginning and inexperienced divers and snorkelers.

#### *Background Information:*

As mentioned in the current recreational use of the area, the number of boats with permits has remained steady, but the amount of passengers/crew the boats carry has grown significantly over the years.

#### *Desired Outcome:*

Vessel groundings and coral breakage from divers and snorkelers are eliminated.

#### *Recommended Action(s):*

1. In order to receive a new commercial permit, new captains and staff must show proof that they have received training on how to use day-use mooring buoys.
2. Protocols for vessel groundings are developed and written into DAR policy.
3. Divers and snorkelers are given instruction on how to maintain buoyancy (and reasons for) and how to properly use equipment (fitting/adjusting of snorkel, fins and mask) prior to entering the water; guides are empowered to provide active in-water management of clients with poor buoyancy.
4. Partner with marine tour operators to develop a Maui usage guide, to include information specific to Molokini, such as use of mooring buoys.

### **Cultural/Historical Resources Impacts**

#### ***Honolua-Mokulē'ia Bay MLCD***

#### *Management Issue:*

Disturbance of historical cultural sites.

#### *Background information:*

The Honolua valley was used for western style ranching and agriculture following the Mahele. Many of the native Hawaiian sites were disturbed during this period. The tsunami of 1946 wiped out all residences and buildings. Thirteen sites have been

identified in Honolua including two Heiau, boulders with grinding surfaces, house platforms/burial mounds, agricultural terraces/houses platforms, and midden (Belt and Collins, 1979).

*Desired Outcome:*

Historical sites are protected and restored with community input.

*Recommended Action(s):*

1. Partner with local groups to restore and maintain heiaus; form agreement with groups to provide maintenance to the sites.

### **Aquatic Invasive Species Impacts**

#### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCD***

*Management Issue:*

Due to adequate population of herbivorous fish at Honolua, the invasive algae population is kept to a minimum. This should continue to be monitored however, due to the increased potential for poaching.

*Background Information:*

Two scientists, Dr. Cindy Hunter and Dr. Celia Smith, both from the University of Hawaii have conducted studies on alien and invasive algae in the last 10 years. Monitoring has shown there is low invasive algae in the bay, likely due to grazing by the abundant herbivorous fish population (DLNR-DAR, 2007).

*Desired Outcome:*

Aquatic and alien invasive species population levels remain at the same level.

*Recommended Action(s):*

1. Continue Eyes on the Reef Trainings; ensure that participants at Ocean Awareness Trainings receive information on key species to be on the lookout for.
2. Develop protocols for boat owners and divers for maintenance of their equipment to prevent the spread of invasive algae.
3. See Enforcement in Section 4 with regards to poaching.

### **Aesthetic Impacts**

#### ***Honolua-Mokulē'ia Bay MLCD***

*Management Issues:*

- Litter is strewn around the bay.
- Overnight campers have been seen at the Bay.

*Background Information:*

No facilities, other than two porta-potties (installed April 2009) exist at the bay. Trash

cans and servicing is limited. In one case, a camper was seen on a ledge in the bay, with fishing equipment.

*Desired Outcome:*

Honolua Bay is kept free from trash and overnight campers are not allowed.

*Recommended Action(s):*

1. Continue community cleanups, at least monthly during high use months.
2. Maintain Makai Watch at Honolua Bay to ensure that a presence is maintained for outreach and surveillance.
3. Work with Maui County legislators to establish a ban on smoking at certain Maui County beaches, which may include Honolua Bay MLCD.
4. Establish more frequent waste disposals in partnership with the County of Maui and Community Work Day.

**Molokini Shoal MLCD**

*Management Issue:*

The proliferation of boats in Molokini crater affect the perceptions of solitude by and view of those on shore.

*Background Information:*

See background information for social/ecological carrying capacity.

*Desired Outcome:*

Number of boats and number of passengers per boat visiting the crater at one time is limited.

*Recommended Action(s):*

See recommendations for social/ecological carrying capacity.

**Marine Mammals, Turtles, Fish, and Seabird Impacts**

***Honolua-Mokulē'ia Bay MLCD***

*Management issues:*

- Turtles are sometimes chased or not given room to swim.
- Fish are fed fish food purchased from local stores or regular human food, such as peas.
- Dolphins are surrounded by kayakers, boats and people in the water.

*Background Information:*

Visitors chasing turtles and dolphins to get a closer look or a good picture is an issue of concern throughout Hawaii. Boats and kayaks have been seen circling a school of dolphins or turtles to get a better look. Fish are often fed human food or fish food sold at local establishments. Several studies have shown fish feeding to produce negative changes in behavior. Some of the effects outlined in a review of these studies include:

time spent obtaining food, the size of the animal's home range, reproductive activity, population density, migration patterns, and species composition due to an increase in the larger, more aggressive species. Fish feeding has also been shown to greatly increase the aggressive behavior of the larger species and result in fish biting hands and other extremities (RIR, 2006).

The "Take a Bite out of Fish Feeding" campaign, a project of the Changing Tides initiative, discouraged the sale of fish food at snorkel/dive shops. This campaign played a key role in the support of the Kahekili Herbivory Enhancement Area project, where fish feeding will be banned.

*Desired Outcome:* Marine animals are not harassed, such as through chasing, being fed or disrupting resting periods.

*Recommended Action(s):*

1. Continue the "Take a Bite out of Fish Feeding" campaign; expand to other general vendors.
2. Develop a DLNR-DAR Ranger program for all MLCDs in Maui County; start a pilot project to encompass both Honolua Bay and Molokini MLCDs.
3. Ensure that dolphin resting areas and times are protected in Honolua Bay; utilize upcoming spinner dolphin EIS from NOAA to provide comments.

### ***Molokini Shoal MLCD***

*Management Issues:*

- Marine invertebrates are handled by both marine operator staff and passengers.
- Leftover food from barbecues are thrown over the side of boats.
- Lights from boats may disturb chick feeding and nesting areas.
- People pick up birds that have fallen out of their nests.
- Hawaiian monk seals are harassed by people in the water.

*Background Information:*

When tours first began at Molokini, operators fed the fish to attract them to their boat so that visitors could see an abundance of fish. Since then, fish feeding has been prohibited at the site; numerous studies show that feeding fish and other marine animals can change their behavior (i.e. chasing and/or biting people) and affect community structure of the ecosystem.

Artificial lights may dazzle and distract birds, possibly leading some to abandon their nests. Young fledglings may fall out of their nests into the water. While night diving (with lights) is limited due to poor weather and ocean conditions, there is concern that this may increase if restrictions on daytime use are imposed.

People in the water have been photographed surrounding a Hawaiian monk seal; that seal has since been relocated to French Frigate Shoals, but the threat still remains.

*Desired Outcome:*

Marine animals and seabirds are left alone and are not disturbed.

*Recommended Action(s):*

1. Ban the use of gloves when diving and/or snorkeling.
2. DAR staff should consult with DOFAW and USFWS when considering restrictions on daytime use of Molokini MLCD.
3. Provide training to naturalists at Ocean Awareness Trainings with regards to seabirds found on Molokini islet.
4. Update Making a Difference Action Guide with regards to seabirds and reminders to people to leave birds in the water if they fall in.
5. Pre-snorkel and dive instructions should include: safety reminders and rules and etiquette regarding Hawaiian monk seals and sea turtles.

## **Human Waste Impacts**

### ***Honolua-Mokulē'ia Bay MLCD***

*Management Issue:*

Human bodily waste is a continual problem at the bay.

*Background Information:*

Due to the lack of facilities at the bay, many people use the bushes or Honolua Bay itself. The nearest facilities are at D.T Fleming Beach Park. Beach cleanups can threaten human health due to the presence of feces in bushes or articles such as baby diapers and feminine products left behind.

*Desired Outcome:*

All visitors will use facilities provided.

*Recommended Action(s):*

1. Until a plan for permanent facilities is approved, porta-potties should be installed at the bay. (After a community-supported effort, on April 11, 2009 the DLNR Office of Conservation and Coastal Lands approved the installation of two porta-potties at the site.)
2. Encourage visitor guides to include tips on visiting Honolua Bay, to include making a visit to restroom facilities prior to their visit. (Indicate where the closest restrooms are located, such as at DT Fleming Beach Park.)

## **Management Programs**

### **Facility Improvements**

#### ***Honolua-Mokulē'ia Bay MLCD***

Honolua Bay is listed as a priority site for the Hawaii Tourism Authority (PBR Hawaii, 2003). The assessment of facilities by PBR Hawaii indicated the highest priority is the lack of parking, which creates a safety issue for visitors. Other needed improvements include: repairing the surface of the two paths from the highway down to the gated site

entrance; posting directional and/or entry signage for the site; and posting interpretive signage about the cultural and historic significance of the bay and the meaning of the place name “Honolua.”

#### *Program Priorities*

1. Develop a task force with the landowner, County of Maui, DLNR-DAR, DLNR-OCCL, DLNR-Historic Preservation, State DOT, and local community members to create a solution to the issue of parking.
2. Work with the landowner, County of Maui, DLNR-DAR, DLNR-OCCL, DLNR-Historic Preservation, State DOT, and local community members to develop appropriate signage for the bay with regards to cultural and historical significance of the bay, and basic watershed/stream information.

### **Visitor Education**

#### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

Education of Hawaii’s visitors is always mentioned as one of the top issues regarding marine resources. While outreach activities have been instituted since 2005 at Honolua Bay, it is difficult and expensive to maintain a daily presence at the bay. In addition, since Makai Watch is shore based, visitors via commercial boat or kayak may not receive the same education about the area. There are also sensitive Native Hawaiian historical sites that would benefit from education/outreach.

At Ahihi Kina’u, a State Natural Area Reserve, rangers were the first to be utilized to educate people about rules and appropriate etiquette when using the site. Rangers are now used around the State at various parks and other high-use areas. A pilot project to educate visitors on board Prince Kuhio was developed by tour operators and community members as a result of CORAL’s micro-grant program and is being expanded to other boats at Molokini.

#### *Program Priorities:*

1. Continue Makai Watch; seek other avenues for funding program, such as use of Hawaii Conservation Corp personnel.
2. Develop a DLNR-DAR Ranger program for all MLCDs in Maui County in conjunction with CORAL Leadership Network and community volunteers; start a pilot project to encompass both Honolua Bay and Molokini MLCDs.
3. Partner with local Native Hawaiian organizations to provide information on cultural resources of the sites.
4. Partner with Division of Aquatic Resources and Division of Conservation and Resource Enforcement to disseminate key information about MLCD rules and regulations to tour operators and ocean users.
5. Continue comprehensive and collaborative Ocean Awareness Training on Maui; seek to expand classes to other parts of the island.

## **Mooring Buoys**

### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

The marine tourism industry has been working with the State since the late 1980's to install day use mooring buoys around the State of Hawaii. The first "legal" mooring buoys were installed at Molokini in 1989. On Maui, the Maui Reef Fund, a program coordinated by the Hawaii Wildlife Fund, installs and maintains buoys for Maui County. The permitting process to install mooring buoys is long. Proposed buoys are reviewed by DLNR-DAR for the number in an area and placement. The Malama Kai Foundation prepares permitting paperwork for DOBOR to submit to the State Historical Review division. The final paperwork is sent to Army Corp of Engineers for final approval. The ACOE posts a public notice, with 90 days for public comment. As of this report, four buoys have been approved by ACOE for installation at Honolua Bay.

#### *Program Priorities:*

1. Install permitted buoys at Honolua Bay.
2. Ensure that new permitted buoys are written into the Hawaii Administrative Rules.
3. Require use of day use moorings (limit one tie-up per buoy); disallow anchoring in the bay.
4. Place limits on number of permits for commercial use of Honolua Bay.
5. Require that all new captains receive training on how to use day use moorings by the Maui Reef Fund Mooring Buoy Maintenance Coordinator.
6. Develop a funding mechanism to provide for a Statewide Day Use Mooring Buoy Coordinator for DLNR.
7. Continue maintenance and upgrades of days use mooring buoys and pin setups.
8. Develop a stable, long term funding source for maintenance of buoys.
  - a. Investigate the use of mitigation funds from vessel groundings as a source of funds.
9. ACOE should require the agency requesting the permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota surveys), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

## **Environmental & Social Monitoring**

### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

Coral reef monitoring data at Honolua Bay shows sharp decreasing trends in coral cover. Water quality monitoring data are scarce, however. Visitor use at Honolua Bay has fluctuated over the years but is expected to increase.

Molokini MLCD is one of the few areas on Maui where coral cover has remained stable over the past ten plus years. Social monitoring linked to day-use mooring buoy utilization was last conducted in 1996 by UH-Sea Grant. More recently, a study jointly

undertaken by the University of Hawaii and Oregon State University sought to evaluate opinions and attitudes of visitors towards the natural resources of Molokini and various degrees of management options for this site; this study is expected to be completed by the end of 2009.

#### *Program Priorities*

1. Continue monitoring of coral reefs, fish and related habitat.
2. Work with DLNR-DAR to institute regular human use survey protocols such that the two sets of data can be correlated and analyzed for trends.
3. Implement a volunteer water monitoring program at Honolulu Bay, to include both education activities as well as more stringent standard protocol driven program.
4. Implement community web-based data entry and management system for multiple monitoring parameters.
5. ACOE should require the agency requesting the day-use mooring buoy permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota surveys, number of snorkelers/divers per buoy per day), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

### **Partnerships and Collaboration**

#### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCs***

In times of increasing budget constraints, partnerships and collaboration are crucial for management of resources. Each managing agency has access to different types of resources; individuals and businesses should also be sought for new partnerships.

A model based on voluntary compliance to recreational use guidelines must involve multiple stakeholders in the decision-making and implementation process. If those who care about Honolulu Bay participate in shaping the future of area, they are more likely to adhere to recommendations in the field or support them from local coastal communities.

#### *Program Priorities:*

1. Seek funding through various partnership opportunities for a DLNR on-site ranger for both MLCs.
2. Share monitoring schedules (DAR, DOCARE, DOBOR, UH) with other agencies without access to boats such as DOFAW and USFWS so that they can coordinate bird monitoring and restoration activities on the islet.
3. Seek volunteers, either within the marine tour operator industry, or with private boat owners to provide transportation to Molokini for onsite ranger duties.

## **OTHER CONCERNS**

### **Administrative Issues**

#### ***Roles of the Managing Partners***

#### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDS***

##### *Management Issue:*

Different agencies and organizations are responsible for various aspects of managing Honolua Bay, Molokini MLCDS and the islet. There is a lack of understanding from all partners about what each is responsible for and how this is interrelated to each entity's duties.

##### *Background Information:*

Not all agencies maintain an office on Maui. Some decisions regarding key issues at Honolua Bay have been made in Honolulu by those who have not been engaged in community issues at the site. For example, even letters of support by the key managing agency on Maui did not advance the process to obtain support for portable toilets until the liaison agent stepped in to describe the situation.

The day-use mooring buoys are seen as the responsibility of the DLNR-DAR, when in fact they are the responsibility of DLNR-DOBOR. DLNR-OCCL used to be the agency in charge of mooring buoys, but this duty was transferred to DOBOR. Mooring buoy permits are approved by the ACOE in Honolulu which can delay the process if they do not rely on the professional expertise of the managing agencies.

##### *Desired Outcome:*

The managing agencies, community groups, and all landowners are in agreement with regards to an overall vision for the bay and how to reach this vision. DOBOR takes a more active role in the administration of day use mooring buoys.

##### *Recommended Action(s):*

1. All managing entities should coordinate in order to agree on a vision for the bay, along with roles and responsibilities for partners, as well as key components of a management plan.
  - a. Have an information sharing session; reach consensus on what each is responsible for and why.
  - b. Explain procedures for obtaining various permits.
2. Continue regular District Manager meetings; hold special meetings with regards to Honolua and Molokini and invite other key partners such as the landowners.
3. Hold a strategic planning summit for all State and County department managers who have direct (i.e. DLNR-DAR) and indirect (i.e. planning, public works, water supply) responsibilities with regards to coral reefs. Attendees will develop an overall strategy for communication and collaboration with regards to impacts to coral reefs.

## **Enforcement**

### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

#### *Management Issues:*

- Poaching occurs in both MLCDs.
- Recent budget cuts have severely limited ability of DOCARE to respond to calls.
- Honolua: Landowner living at the bay has restricted access to the area in the past and may do so in future.

#### *Background Information:*

It is believed that poaching occurs at Honolua Bay, especially at night, when the crowds have dispersed. A kuleana landowner was reported in 2006 to have been blocking access to Honolua Bay and requesting a donation much like a user fee; this scenario has re-emerged in 2009. Visitor complaints have become apparent through feedback to activity agencies, concierges, and other businesses.

Due to the recent woes of the economy, all State departments have received large budget cuts. DOCARE had been receiving increases in the past several years to enhance enforcement efforts, but now any improvements made will be delayed. DOCARE will be struggling to find funds to maintain vehicles and respond to all calls.

#### *Desired Outcome:*

DOCARE is sufficiently funded to respond to violations. Poaching is eliminated and rules regarding activities conducted on conservation district lands are clarified or added into HAR 15-5.

#### *Recommended Action(s):*

1. Investigate the use of setting up a special fund for DLNR violations; ensure that DOCARE receives a percentage of those funds for operations. Clarify and publicize 'informer's fee' to encourage the reporting of violations.
  - This may include fines for fishing/hunting violations or larger fines for coral reef damage.
2. Develop vessel grounding protocols; ensure that DOCARE has input into the protocols.

#### *Honolua Bay Specific:*

3. Investigate the use of a hidden camera for nighttime use.
4. With regards to business activities on conservation district lands, determine if new rules are needed or are the responsibility of the landowner to approve.

## **Sustainable Funding**

### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

*Management Issue:*

A sustainable source of funds is needed to support conservation efforts, including outreach and enforcement at the MLCDs.

*Background Information:*

Lack of funds for maintaining and improving conservation efforts is a continual challenge around the world, especially within the current economic climate. Budgets are slashed at all levels, from the individual, to businesses to local, state and federal governments. It is critical that new and creative ideas are developed to boost conservation efforts which do not require large sums of money.

*Desired Outcome:*

New sustainable financing mechanisms are developed. People take steps to improve their environment with little funding investment.

*Recommended Action(s)*

1. Investigate the development of a transient accommodation tax.
2. Assemble a list for new partnerships to pool funding and resources. List should include organization name, organization type, expertise, and source of funds. Determine if list of partnership(s) is feasible; if feasible, develop mechanism for creating new partnership (whether through an MOU, or third-party fiscal agent)
3. Develop framework for a coral reef mitigation program. (The Nature Conservancy is currently working on this)
4. Work with appropriate industry and stakeholders to develop an appropriate fee structure.
5. Design a financial sustainability plan for coral reef management that incorporates a diversity of national, regional and international funding sources and mechanisms and includes:
  - a. Analysis of current financial income and expenditures, overall financial needs and gaps;
  - b. Analysis of the administrative, legal and management-related barriers and address these in order to create an enabling environment and to facilitate financial sustainability;
  - c. Concrete and comprehensive needs assessments to create better insight in the necessary resources for activities;
  - d. Definition and quantification of coral reef goods and services, and potential sources of investment to pay for such goods and services;
  - e. Screening and feasibility analysis of potential financial mechanisms; and
  - f. Sustainable national financing plans for coral reefs.

## **External Influences**

### **Lack of Awareness**

#### ***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

*Management Issue:*

People, both visitors and residents, may be unaware of the impact that their actions have on the marine environment. This includes both in the water and on land.

*Background Information:*

Education of visitors and residents with regards to marine resources is perhaps the top overall general solution to conservation within the marine environment. Several organizations around the state conduct outreach in various ways: Makai Watch, watershed groups, local schools, or via rangers at high use areas. In 2003, the Living Reef Campaign utilized a market survey to develop a series of coral reef outreach messages via a branding strategy. Groups and individuals around the state participated in developing these messages, and formed the Coral Reef Outreach Network. A series of public service announcements were developed for television and radio, various news articles, a video and an annual living reefs awards ceremony.

*Desired Outcome:*

Visitors and residents learn about appropriate behavior while in the water and take actions to mitigate their impacts on the coral reef ecosystem. Residents, including businesses incorporate sustainable living practices into their daily lives to help protect the coral reef ecosystem.

*Recommended Action(s):*

1. Continue Ocean Awareness Trainings; seek to target specific stakeholders and provide “mini-training” courses in conjunction with CORAL Leadership Network and community volunteer programs by conducting the training at their business.
2. Prioritize list of target audiences and develop set of actions.
  - a. Determine which audience has not been reached effectively yet.
3. Partner with tour businesses that provide information to visitors on packaged tours via bus or car. Work with DBEDT to revisit and update previously-developed materials for training tour bus operators.
4. Partner with hotels to determine how to incorporate coral reef messaging into the visitor experience at the hotel. Ask them to brainstorm ideas, and provide them with appropriate tools and resources.

**Land-Based Pollution**

Honolua-Mokulē‘ia Bay MLCD

*Management Issue:*

Pollution, such as litter, chemicals, and sediment from activities occurring on land impact the coral reef ecosystem.

*Background Information:*

Land based pollution is seen as one of the top threats to coral reefs in the world. The State of Hawaii developed a Local Action Strategy to address land based pollution in 2004, focusing on three ahupua‘a, including Honolua Bay. Sources of land-based pollution are many, and range from agriculture, urban development and feral ungulates roaming the watersheds. Sediments smother coral, too many nutrients can promote algal overgrowth, and corals may develop disease from chemicals.

*Desired Outcome:*

Healthy coral reef ecosystems, including steady improvement in coral cover, decline of marine disease, sustainable fish populations, and clean water.

*Recommended Action(s):*

1. Support the County of Maui's efforts to secure the conservation designation of Lipoa Point and surrounding shoreline from Maui, Land & Pineapple.
2. After land ownership of the area is resolved by the entities currently in negotiation, develop and implement a watershed management plan for Honolua Bay.
3. Support ACOE and DOFAW's efforts to conduct a West Maui Watershed "ridge to reef" assessment. Support the West Maui Soil and Water Conservation District efforts to update the West Maui Watershed Management Plan. Ensure that issues relating to Honolua Bay watershed are included in both plans.
4. Continue with efforts to start a volunteer water quality monitoring program at Honolua Bay.
5. Support NOAA's Marine Debris Action Plan for Hawaii, especially the outreach component.

**Promotion of the Resource and Boating**

***Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs***

*Management Issue:*

Honolua Bay and Molokini Shoal are both promoted in visitor guides and at snorkel/dive shops as a "must see" for snorkeling. Many people visit Honolua Bay from shore, unaware of the challenging conditions and lack of facilities at the bay.

*Background Information:*

A study in 1999 quantified the economic impact of commercial whale watching and other humpback-related ocean touring businesses in Hawai'i, as well as quantifying the broader economic impact of the ocean tour boat industry. Direct revenues attributable to whale watching were \$11-16 million during the 1999 whale season. A similar report on Hawaii's boat industry was updated in 2003. It found that the boat industry, most of these small businesses, generated about \$184 million in gross revenue annually and employed more than 2000 people.

*Desired Outcome:*

Visitation levels remain at sustainable levels in accordance with carrying capacity studies.

*Recommended Action(s):*

1. Continue to monitor human use at Honolua Bay; start monitoring human use at Molokini Shoal.
2. Determine ecological and social carrying capacities of Honolua Bay and Molokini Shoal.
3. Based on results of carrying capacity study, revise HARs to limit number and size of boats and kayaks (Honolua only) visiting Honolua Bay and Molokini Shoal.
4. Conduct economic benefit surveys of ocean tourism industry every five years.

## **Promotion of Tourism**

### *Management Issue:*

Tourism is the number one revenue source in the State of Hawaii; natural resources such as beautiful beaches, turtle sightings and warm water are promoted to attract visitors. Too much promotion of heavily used areas can have negative effects on the resources.

### *Background Information (from Blackford, 2001):*

Several studies have been conducted on the change in Hawaii's focus in economic development from agriculture to tourism, with the change first occurring on Oahu. Maui first began the switch in the 1950s and 1960s, due to the decline of the sugar and pineapple industries. In 1953, 66% of Maui's residents were employed in agriculture, mainly sugar and pineapple. Only 1% worked in hotels and 2% in construction. Residents left the county looking for better jobs.

In 1955, Maui's business and political leaders came together to finance a study of economic possibilities; a major recommendation was that the County should promote tourism. The Maui Economic Development Association (MEDA) was set up to encourage new businesses, especially those in the visitor industry. The Hawaiian Territorial Legislature also supported the Counties' economic development, by passing an act calling for "a planned, coordinated program of developing the economic potential of the territory". A general plan was prepared, with each County submitting its own draft plan. Maui submitted their plan in 1959, stating that "Maui's future lies in the developments of the tourism industry," and included improvements to street, sewer and water systems, creating plans of parks and civic centers, to aid visitor industry developments.

As tourism grew as a major industry on Maui, others were concerned about its role in the economic development of Maui. A 10 year plan was developed in the late 1970s, with a goal for "the growth of resident and visitor populations so as to avoid social, economic, and environmental disruptions," with a major objective "to perpetuate the unique lifestyles of our people." The Maui Economic Development Board (MEDB) was formed in 1982 specifically to help nurture high technology ventures through the creation of a high tech park.

At the same time that tourism was being promoted in the 1950s and 1960s, there was also concern about Maui's environment.

### *Desired Outcome:*

Areas that continually promoted as "must see sites" have information provided to guests prior to and during their visit.

### *Recommended Action(s):*

1. Partner with HTA and the Maui Visitors Bureau to encourage their members to work closely with local organizations to provide outreach information to their guests.

2. Partner with hotels to provide workshops or presentations on the marine environment to their visitors.
3. Partner with hotels to provide announcements on other events at other facilities (such as the Hawaiian Islands Humpback Whale National Marine Sanctuary, aquarium, local schools, etc.) related to the marine environment or cultural resources.
4. Continue with the Changing Tides Outreach program; use the program to target specific user groups.

# Conclusion and Summary of Major Recommendations

## Conclusion

Conservation issues, including managing marine protected areas in today's economic climate, is increasingly difficult. Many people prefer to visit their local areas on vacation to save money, rather than visiting tropical areas with warm water and exotic scenery like Hawaii. On one hand, this lessens the burden on the environment; on the other, it makes it difficult to raise funds to maintain conservation efforts.

Because of shrinking budgets, local community involvement in stewardship of our natural areas becomes increasingly important. People can help to educate others about the environment, conduct biological monitoring, or raise funds. The White House supports volunteer efforts; in February 2009, President Obama called on U.S. residents to volunteer time to help improve their communities.

This report summarized completed projects, ongoing efforts and management issues with regards to two marine protected areas on Maui: Molokini Shoal and Honolua-Mokule'ia Bay Marine Life Conservation Districts. Issues and recommended actions were derived from comments of marine managed areas public meetings, Coral reef alliance workshops, and current interviews with management agencies.

While it is clear that several obstacles need to be overcome with regards to both MLCDs, there is a great deal of agreement amongst agencies and residents about what is needed and what can be accomplished in the immediate future. The main keys to conservation efforts lie in education, enforcement and a source of sustainable funding.

## Major Recommendations

- Support a DLNR-DAR ranger for both Molokini Shoal and Honolua-Mokule'ia Bay Marine Life Conservation Districts. Consider partnering with others, including private boat owners to provide an on-the-water presence.
- Support and continue the Ocean Awareness Training workshops and further develop the CORAL Reef Leadership Network sustainable marine recreation training; seek to work with targeted stakeholders and provide on-site training (i.e. at the hotel, or place of business) for employees. Ensure that information includes:
  - Coral reefs
  - Fish, invertebrates, marine mammals, turtles, and seabirds
  - Threats to coral reefs and what you can do
  - Water quality
  - Etiquette information
  - Marine Managed Area and protected species rules and regulations
  - Enforcement information (what to do and who to call)
- Support and continue outreach, cleanup and monitoring efforts at Honolua Bay.

- Maintain day-use mooring buoys; develop stable funding mechanism to pay for maintenance.
- Develop a watershed management plan for Honolua Bay.
- Determine carrying capacity (both social and ecological) at both MLCDs; agencies should work with all stakeholders to find an acceptable solution.
- Include funding for DOCARE when considering applying for grants. Example: DAR-Kona received funding for various pieces of equipment through a grant obtained by a local nonprofit organization.

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## **Appendix A. Potential community projects**

These actions are from Sections 3 and 4, and are actions that the community can directly implement, or can help move forward by collaborating with management agencies/organizations. In some cases, the community will need come together in a cohesive unit and voice their concerns to make new rules or implement new plans.

### **Recreational Use Issues & Actions**

#### **Public Access:**

##### Honolua-Mokulē‘ia Bay MLCD

1. Work with the community, landowner, State Department of Transportation, DOCARE, DAR, and County Police to find a temporary solution to parking.
2. Work with landowners to determine mutually-agreed upon solutions to access issues.
3. Work with community or private contractor to perform necessary maintenance on access road to prevent further erosion.

##### Molokini Shoal MLCD

4. Remind commercial operators about public use of day use moorings when they apply for permits; make available and distribute the day-use mooring guide developed by the Malama Kai Foundation and the Maui Reef Fund.
5. Educate recreational boaters about the use of buoys at zones A, B and C; outreach can be conducted through various actions such as:
  - a. Posters at marine supply, dive and fishing stores
  - b. Email list serves
  - c. Coast Guard Boating Classes
  - d. Hawaiian Islands Humpback Whale National Marine Sanctuary Boating Classes;
  - e. Ocean Awareness classes

#### **Social/Ecological Carrying Capacity and Recreational Development:**

##### Honolua-Mokulē‘ia Bay MLCD

1. Install permitted day use mooring buoys.
2. Implement Scenario 1 of Courtney’s “Recreational Carrying Capacity Evaluation of Honolua Bay”.
3. Limit vessel use at Honolua Bay to day use mooring buoys; ban anchoring in the MLCD. (HAR 13-257, HAR 13-32 rule revision)
4. Consider seasonal limitations on use of the bay. (HAR 13-32 rule revision)

##### Molokini Shoal MLCD

4. ACOE should require the agency requesting the permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota

surveys), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

### **Coral Reef Impacts:**

#### Honolua-Mokulē'ia Bay MLCD

1. Limit recreational use as indicated in the carrying capacity and recreational development issues.
2. Develop community workdays to conduct limited maintenance of the trail leading to the bay.
3. The County of Maui and MLP should continue discussions with regards to purchase of Lipoa Point and surround area.
4. Begin long term in-situ turbidity monitoring.
5. Divers and snorkelers are given instruction on how to maintain buoyancy (and reasons for) and how to properly use equipment (fitting/adjusting of snorkel, fins and mask) prior to entering the water.
6. Partner with dive shops, hotels and beach concessions that rent snorkeling gear to provide tools and educational strategies with regards to snorkeling etiquette.
7. Partner with hotels to provide presentations on the marine environment to their staff and guests.
8. Partner with marine tour operators to develop a Maui usage guide, to include information specific to Honolua.
9. Provide for floating interpreters in kayaks, snorkeling, or on independent vessels.
10. Contact Maui yacht clubs (Maui Boat and Yacht Club, Lahaina Yacht Club) and provide captains with locations of day use moorings and training on use of moorings.

#### Molokini Shoal MLCD

5. In order to receive a new commercial permit, new captains and staff must show proof that they have received training on how to use day use mooring buoys.
6. Divers and snorkelers are given instruction on how to maintain buoyancy (and reasons for) and how to properly use equipment (fitting/adjusting of snorkel, fins and mask) prior to entering the water; guides are empowered to provide active in-water management of clients with poor buoyancy.
7. Partner with marine tour operators to develop a Maui usage guide, to include information specific to Molokini, such as use of mooring buoys.

### **Cultural/Historical Resources Impacts:**

#### Honolua-Mokulē'ia Bay MLCD

1. Partner with local groups to restore and maintain heiaus; form agreement with groups to provide maintenance to the sites.

### **Aquatic Invasive Species Impacts**

#### Honolua-Mokulē'ia Bay and Molokini Shoal MLCD

1. Continue Eyes on the Reef Trainings; ensure that participants at Ocean Awareness Trainings receive information on key species to be on the lookout for.
2. Develop protocols for boat owners and divers for maintenance of their equipment to prevent the spread of invasive algae.
3. See Enforcement in Section 4 with regards to poaching.

## **Aesthetic Impacts**

### Honolua-Mokulē‘ia Bay MLCD

1. Continue community cleanups, at least monthly during high use months.
2. Maintain Makai Watch at Honolua Bay to ensure that a presence is maintained for outreach and surveillance.
3. Work with Maui County legislators to establish a ban on smoking at certain Maui County beaches, which may include Honolua Bay MLCD.
4. Establish more frequent waste disposals in partnership with the County of Maui and Community Work Day.

### Molokini Shoal MLCD

5. ACOE should require the agency requesting the permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota surveys), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

## **Marine Mammals, Turtles, Fish and Seabird Impacts**

### Honolua-Mokulē‘ia Bay MLCD

1. Continue the “Take a Bite out of Fish Feeding” campaign; expand to other general vendors.
2. Develop a DLNR-DAR Ranger program for all MLCDs in Maui County; start a pilot project to encompass both Honolua Bay and Molokini MLCDs.
3. Ensure that dolphin resting areas and times are protected in Honolua Bay; utilize upcoming spinner dolphin EIS from NOAA to provide comments.

### Molokini Shoal MLCD

6. Ban the use of gloves when diving and/or snorkeling.
7. Provide training to naturalists at Ocean Awareness Trainings with regards to seabirds found on Molokini islet.
8. Update Making a Difference Action Guide with regards to seabirds and reminders to people to leave birds in the water if they fall in.
9. Pre-snorkel and dive instructions should include: safety reminders and rules and etiquette regarding Hawaiian monk seals and sea turtles.

## **Human Waste Impacts**

### Honolua-Mokulē‘ia Bay MLCD

1. Until a plan for permanent facilities is approved, porta-potties should be installed at the bay. (After a community-supported effort, on April 11, 2009 the DLNR Office of Conservation and Coastal Lands approved the installation of two porta-potties at the site.)
2. Encourage visitor guides to include tips on visiting Honolua Bay, to include making a visit to restroom facilities prior to their visit. (Indicate where the closest restroom are located, such as at DT Fleming Beach Park)

## **Management Programs**

### **Facility improvements:**

#### Honolua-Mokulē'ia Bay MLCD

1. Develop a task force with the landowner, County of Maui, DLNR-DAR, DLNR-OCCL, DLNR-Historic Preservation, State DOT, and local community members to create a solution to the issue of parking.
2. Work with the landowner, County of Maui, DLNR-DAR, DLNR-OCCL, DLNR-Historic Preservation, State DOT, and local community members to develop appropriate signage for the bay with regards to cultural and historical significance of the bay, and basic watershed/stream information.

### **Visitor Education**

#### Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs

1. Continue Makai Watch; seek other avenues for funding program, such as use of Hawaii Conservation Corp personnel.
2. Develop a DLNR-DAR Ranger program for all MLCDs in Maui County in conjunction with CORAL Leadership Network; start a pilot project to encompass both Honolua Bay and Molokini MLCDs.
3. Partner with local Native Hawaiian organizations to provide information on cultural resources of the sites.
4. Partner with Division of Aquatic Resources and Division of Conservation and Resource Enforcement to disseminate key information about MLCD rules and regulations to tour operators and ocean users.
5. Continue comprehensive and collaborative Ocean Awareness Training on Maui; seek to expand classes to other parts of the island.

### **Mooring Buoys:**

#### Honolua-Mokulē'ia Bay and Molokini Shoal MLCDs

1. Install permitted buoys at Honolua Bay.
2. Ensure that new permitted buoys are written into the Hawaii Administrative Rules. (HAR 13-257 rule revision)
3. Require use of day use moorings (limit one tie-up per buoy); disallow anchoring in the bay. (HAR 13-257 rule revision)

4. Place limits on number of permits for commercial use of Honolua Bay.
5. Require that all new captains receive training on how to use day use moorings by the Maui Reef Fund Mooring Buoy Maintenance Coordinator.
6. Develop a funding mechanism to provide for a Statewide Day Use Mooring Buoy Coordinator for DLNR. (may need support of stakeholders)
7. Continue maintenance and upgrades of days use mooring buoys and pin setups.
8. ACOE should require the agency requesting the permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota surveys), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

## **Environmental & Social Monitoring**

### Honolua-Mokulē'ia Bay and Molokini Shoal MLCDS

1. Continue monitoring of coral reefs, fish and related habitat.
2. Work with DLNR-DAR to institute regular human use survey protocols such that the two sets of data can be correlated and analyzed for trends.
3. Implement a volunteer water monitoring program at Honolua Bay, to include both education activities as well as more stringent standard protocol driven program.
4. Implement community web-based data entry and management system for multiple monitoring parameters.
5. ACOE should require the agency requesting the permit to submit reports from a monitoring program (pre and post use of the area by endangered and threatened species, pre and post installation conditions of corals and other benthic biota surveys, number of snorkelers/divers per buoy per day), to determine both positive and negative impacts from mooring buoys. The UH Marine Option Program was utilized for this in prior years.

## **Partnerships and Collaboration**

### Honolua-Mokulē'ia Bay and Molokini Shoal MLCDS

1. Seek funding through various partnership opportunities for a DLNR on-site ranger for both MLCDS.
2. Seek volunteers, either within the marine tour operator industry, or with private boat owners to provide transportation to Molokini for onsite ranger duties

## **Administrative Issues**

### **Roles of the Managing Partners**

### Honolua-Mokulē'ia Bay and Molokini Shoal MLCDS

1. All managing entities should coordinate in order to agree on a vision for the bay, along with roles and responsibilities for partners, as well as key components of a management plan.
  - a. Have an information sharing session; reach consensus on what each is responsible for and why.
  - b. Explain procedures for obtaining various permits.
2. Hold a strategic planning summit for all State and County department managers who have direct (i.e. DLNR-DAR) and indirect (i.e. planning, public works, water supply) responsibilities with regards to coral reefs. Attendees will develop an overall strategy for communication and collaboration with regards to impacts to coral reefs.

## **Enforcement**

### Honolua-Mokulē‘ia Bay and Molokini Shoal MLCDS

1. Investigate the use of setting up a special fund for DLNR violations; ensure that DOCARE receives a percentage of those funds for operations. Clarify and publicize ‘informer’s fee’ to encourage the reporting of violations.
  - a. This may include fines for fishing/hunting violations or larger fines for coral reef damage.

### Honolua Bay specific:

2. Investigate the use of a hidden camera for nighttime use.

## **Sustainable funding**

### Honolua-Mokulē‘ia Bay and Molokini Shoal MLCDS

1. Investigate the development of a transient accommodation tax.
2. Assemble a list for new partnerships to pool funding and resources. List should include organization name, organization type, expertise, source of funds. Determine if list of partnership(s) is feasible; if feasible, develop mechanism for creating new partnership (whether through an MOU, or third-party fiscal agent)
3. Work with appropriate industry and stakeholders to develop an appropriate fee structure.

## **External Influences**

### **Lack of Awareness**

### Honolua-Mokulē‘ia Bay and Molokini Shoal MLCDS

1. Continue Ocean Awareness Trainings; seek to target specific stakeholders and provide “mini-training” courses in conjunction with CORAL Leadership Network and other educational efforts by conducting the training at their business.
2. Prioritize list of target audiences and develop set of actions.

- a. Determine which audience has not been reached effectively yet.
3. Partner with tour businesses that provide information to visitors on packaged tours via bus or car. Work with DBEDT to revisit and update previously-developed materials for training tour bus operators.
4. Partner with hotels to determine how to incorporate coral reef messaging into the visitor experience at the hotel. Ask them to brainstorm ideas, and provide them with appropriate tools and resources.

## **Land Based Pollution**

### Honolua-Mokulē‘ia Bay MLCD

1. Support the County of Maui’s efforts to secure the conservation designation of Lipoa Point and surrounding shoreline from Maui, Land & Pineapple.
2. Support ACOE and DOFAW’s efforts to conduct a West Maui Watershed “ridge to reef” assessment. Support the West Maui Soil and Water Conservation District efforts to update the West Maui Watershed Management Plan. Ensure that issues relating to Honolua Bay watershed are included in both plans.
3. Continue with efforts to start a volunteer water quality monitoring program at Honolua Bay.
4. Support NOAA’s Marine Debris Action Plan for Hawai‘i, especially the outreach component.

## **Promotion of the Resource and Boating**

### Honolua-Mokulē‘ia Bay and Molokini Shoal MLCDs

1. Continue monitoring of human use at Honolua Bay; start monitoring human use at Molokini Shoal.
2. Based on results of carrying capacity study, revise HARs to limit number and size of boats and kayaks (Honolua only) visiting Honolua Bay and Molokini Shoal.

## **Promotion of Tourism**

### Honolua-Mokulē‘ia Bay and Molokini Shoal MLCDs

1. Partner with HTA and the Maui Visitors Bureau to encourage their members to work closely with local organizations to provide outreach information to their guests.
2. Partner with hotels to provide workshops or presentations on the marine environment to their visitors.
3. Partner with hotels to provide announcements on other events at other facilities (such as the Hawaiian Islands Humpback Whale national Marine Sanctuary, aquarium, local schools, etc.) related to the marine environment or cultural resources.
4. Continue with the Changing Tides Outreach program; use the program to target specific user groups.

## **Appendix B: Summary of CORAL Workshops: Threat Assessment and Potential Solutions**

Taken from notes at Coral Reef Alliance 2005 and Ocean Awareness 2008 workshops

### Recreation Impacts

#### *Boats*

- More education on boats
- Teach to look but not touch. Hold discussion before use of ocean and take time to discuss what was seen afterwards.
- On all boats, hotels, etc. have Training videos
- Basic education for the boat crews
  - Making sure tour guides/dive leaders model the act of NOT leaving a mark, not touching sea life
- Stop allowing quickly trained divers to go out on the reefs- require full training
- Taking names of boats that are constantly in area to hold boats accountable for their waste dumping
- Less sewage; 100% pump and dump
- Educate divers when they learn to dive
- Operations should monitor” terrible 10 minutes”

#### *Hotels*

- Hotel awareness- classes offered in hotel
- Utilize messages from the kids
- Hotels: put brochures in room
- On all boats, hotels, etc. have Training videos
- Hotel participation in environment for guests on Island – classes and free activities
- Boards in Hotel of out- reach programs
- All visitors must register that they have participated in a learning demo. About our Hawaiian waters
- Fish ID/ educational waterproof package visitors can take w/ them upon check-in
- Fliers on airplanes and on visit channel
- Dive Shops and resort rentals for snorkeling gear- provide information snorkeling etiquette

#### *Media-Movies*

- At movies (previews) Video

#### *Media-TV/Radio*

- Visitor channel- public service announcement air- time
- Utilize messages from the kids
- Local television, Akaku, Channel 7 educate there

### *Media-Print*

- Threat coral as animal- print coral information in magazines
- Utilize messages from the kids

### *Internet*

- Website- shoot films for education

### *Car Rentals*

- Place Flyers in rent a car (Vistaprint.com)
- Map with educational information on back

### *Ocean recreation business shops*

- Target dive shops for education brochures
- Brochures to be attached to all rented snorkel gear and rental cars
- Educate people in businesses that depend on reefs and the ocean
- Education for marine naturalists in water tourism
- Operations should monitor "terrible 10 minutes"

### *Other Local businesses*

- Target private contractors aka Beach activity
- Education of small business that offer tours

### *Land based*

- Kiosk- education for everyone at the beach
- Having naturalist at popular tourist beaches
- Make information easily accessible to the tourist; easily learned.
- More educational signs for popular reefs
  - Bilingual signs
- Classes that are free that inform people of environmental effects of their actions

### *Airlines/Airports*

- Put Ziggy film in baggage claim
- Put ziggy's CD on the planes by increasing political pressure
- Fliers on airplanes and on visit channel
- Check w/department of agriculture to see if they have influence to get it on

### *Messaging*

- Content of Messaging:
  - Lack of awareness- using fish nets to catch fish
  - Don't feed the fish
  - Don't throw coral rocks onto the reef
- Educate reef users:
  - walking on reef
  - divers- do not pick coral
  - suntan lotion/oil causes chemical in water

- people after picnics leaves napkins, plastic forks and bags which end up in the ocean
- don't feed fish
- Information on who regulates laws and reinforces marine protection laws
- Make information handy at all times. Placards or tags w/ ocean etiquette and ocean awareness. Gear instruction

#### *Water quality*

- Require biodegradable sunscreen
- Alternative sun care products- Rash guards

#### *Other*

- Concentrate on other types of industry other than tourism to give the ocean a break to recover

### Unsustainable Fishing

#### *Issues*

- Seeing past the present. Food now= no food later
- Someone to enforce
- Fish trade

#### *Outreach/education*

- Public awareness
- Bigger not better. Let big fish go
- Pass on knowledge of fishing skills

#### *Solutions*

- Promote other edible fish options

#### *Enforcement*

- Enforcement at harbors and boat ramps
- Education and enforcement/management of fishing charters

#### *Rules/regulations*

- More laws supporting common sense
- Fishing license laws
  - use money to expand enforcement and education
  - Require licenses to know laws regarding sizes, seasons etc.
  - charge to hire an enforcer
- Enforce seasons for various kinds of fish
- Increase enforcement
- Run off commercial fishing permits
- Legislation to ban commercial aquarium
- Size and quantity limitations

- Bait and release

#### *Marine debris issues*

- Fishing tackle and nets recovery
- Proper disposal of trash
- Holding fishing companies responsible for their hardware in the ocean.
- Recycle fishnets and lines
- Everyone- Pick up trash on the beach have scissors with you to cut line off reef

#### Land-based Pollution

##### *Issues*

- Construction- Run off
- Concretization
- Injection Wells
- Land debris run off collecting garbage on beaches and sea
- Run off from golf courses, development, agriculture, sewage systems( infection wells)

##### *Outreach/education*

- Approach water, sewer and MECO about putting fliers in bill
- Identify contact and educate pollution:
  - Companies
  - Eco-Tourism industry
  - Home owners/ resorts
- For all educate them on the plane with a video and literature
- Education people that it all “runs out to ocean”
- Educate about going organic / not using fertilizers or pesticides
- Low impact cars= like oil, gas leaks, water injection
- Increase awareness of impact of consumerism: paper bags, reduce paper usage, water bottles, coffee cups

##### *Sustainable uses*

- Improve Transportation
- Promote Recycling Efforts: make it “easier” to recycle ( government involvement)
- Promote Energy efficient methods
  - transportation ( fuel efficiency )
  - home operation( lighting- LED’s)
- Take advantage of current economic situation to embrace a more sustainable use of the land.
- Reclaiming water; Legislation to redirect grey water
- Recycle treated sewage instead of the use of injection wells
- Require all developers to create green areas in all new developments
- Encourage recycling (fast food containers, plastic bags)
- Environmentally wise development

### *Other solutions*

- Invest in intelligent infrastructure
- Promote partnerships
- Promote marine protection area
- Regulate runoff-pollutants
- Enforce – funded by construction company
- Find more eco-friendly agricultural procedures such as:
  - Use traps instead of chemical to kill mosquitoes/fruit fly's
  - Contain runoff on land
  - Reduce over irrigation
  - Proper disposal of harmful chemicals; use bio-degradable chemicals
  - Proper containment of waste
  - Use cover crops. Natural fertilizers (to aid in erosion) crop rotation
- Sedimentation monitoring of water ways
- Golf courses
  - Use natural/ organic fertilizers in a responsible way and regulated
  - Balance- not so many golf courses, truly necessary? Need less water and chemical use to keep up
  - Increase nature/ Ecological based activities vs. golf and resorts
- New Laws
- New Technology
- Tie development to demonstrate abilities to handle sewage/ water usage
- Regulate land use- for farming and traditional warp
- Limit/ Increase regulations on use of land

### *Cigarette Butts*

- Make containers available for smokers to discard butts( possible slogan makes container a souvenir)
- Sign on trash can- saying “please place cigarette butts here” with small explanation of why...
- Film cans for cigarettes ( increase distribution points)

### *Litter*

- Introduce recycle bags with ecological information what can be used as souvenirs for visitors
- Plastic Bag Bans
- Cleanups
  - Use community service for beach clean- up
- Take bags with you at the beach to pick up debris

### Aquatic invasive species

- Algae
- Eradication of certain species
- Regulation
- Research

## Lack of Awareness

### *Keiki/public schools*

- Public school system education
- Educate young people in the local areas
- Get local people to jump aboard grassroots efforts
- Start with schools at an early age
- Local School Projects (poster contest)
- Your guests educate them (starts at home)
- School programs for local kids and their teachers
- Teaching / informing kids of the benefits of being environmentally friendly at a reasonable cost
- Kama'aina rate for ambassador kids' program

### *Branding/themes*

- Educate with music- have professionals like Willy Nelson and educate with catchy tunes
- Create characters that is reoccurring image and theme (e.g. Nemo says " Protect our reefs")
- Make a light hearted educational video-Elementary and easy to follow- use lots of graphics (for foreign visitors)

## **Molokini specific:**

### Lack of Monitoring and Enforcement/Management issues

#### *Solutions: Funding*

- User fee for those who go into water with tourism entities... tours, hotels
  - \$1 for every hotel night
  - \$1 for every cruise line passenger
- Operators add a fee for ranger presence

#### *Solutions: On the water enforcement*

- Have constant boat operators/dive guides report ongoing problems
- An empowered person at Molokini 7am –1am (to start with)
- Bring camera to document infractions
- Community watch expand to molokini observers
- Hotline to enforcement
- Request coast guard auxiliary to help monitor
- A Molokini specific enforce official rangers
- Employ divers/surface snorkelers to document and enforce current laws
  - Enlist (Jobs corps / community work day) Maui Ocean Center etc.
- Make it a priority that a crew member on board is a "reef ranger" i.e. dive master / reef rangers

#### *Solutions: Education*

- Dedicate funds to train naturalists
- Make a huge enforcement push teamed with education crew and campaign
- Self policing and crew education
- Fines/Rewards for good behaviors
  - For infraction cite the operator
- Monthly award local good citizen/operator group

*Solutions: Management/policy making*

- Contacting proper agencies (what are they???)
- More Education: Publicize laws: especially for dive masters
- Become more active politically
- Make a national park to ensure rangers and enforcement
- Create a management plan for boat operators

Lack of Education / Awareness

*Outreach materials*

- Video on boat....everywhere (airplane, bus, visitor channel, hotel, beaches)
- Fish Education Cards to bed guest
- Accessible reference materials send to pacific whale foundation or Maui ocean center
- Recurring video played in retail rental stores
- Educator present in water with small groups
- Spot on tourist TV channel

*Awareness focus*

- Educate ourselves
- Visitors that we take to water
- Role Models for others

*Trained naturalists*

- Put an educated physical presence with each group (naturalist)
- Hire train more naturalist
- Support volunteers on board

*Marine operator certification*

- Molokini: Usage Guide
- Certification for all operators
- Code of Conduct for operators / + users
- Course/update workshop for operators as a renewal for license
- Limit guest on boards
- Encourage companies to train employees on reefs
- Teach all using molokini (including operators / crew/ naturalists) that it is a marine reserve and what that means
- Require trainings in sustainable method to ALL crew and ops

### *Education of visitors*

- Offer users collectible item for attending a seminar (incentive)
- Expanded briefings on boats – hand signals
- Show briefing video for Molokini (also before renting any gear) – mandatory
- Better signage – underwater monuments with main rules
- No touch, not fish food, no going on land
- Government enforced mandatory training for all snorkelers and divers i.e.; Bonaire, Hanauma bay along with purchase of dive and snorkel license

### Carrying Capacity

#### *Rules/Policy making*

- Lobby Legislators
- Regulate type of use (snorkel vs. diving vs. SNUBA)

#### *Management*

- Determine Carrying Capacity – Studies
- Molokini Management Plan (Mooring, Carrying Capacity , Revise Regs, Limit vessel # and size, Vessel Use, Alternate days / use schedule)
- Look at alternative dive/snorkel locations

#### *Group sizes*

- Break large groups into smaller more manageable ones
- Restricting guide ratios
- Restrict number of people into Molokini in one day
- Hold a raffle at concierge desk – relating to limiting number of guests aboard at one time

#### *Boat size/moorings*

- Limit number of moorings and color code them for boat size
- Restricting vessel numbers allowed at one time – Have AM and PM restrictions
- Restrict vessel size / carrying capacity
- Permit required; enforce use
- Limit number of moorings – already limited

#### *Education*

- Educate operators about impacts of capacity
  - Advertise “lower number – lower impact”? As a marketing tool
  - Promote a “community organization of boat operators” to determine their own management

### Contact / Touching

#### *Group size/supervision*

- If 150 and over people on a boat – segment to manageable group sizes and supervise small groups of snorkelers
- Supervising / presence needs to be with each group
- Educate in small groups on boats
- Personal interaction with individuals
- More inclusive dive/snorkel briefings

#### *Outreach materials*

- Printed materials in hotel rooms, rental cars and magazines
- PSA on airlines, cruise ships, etc.
- Plane video info! TV Channel 7
- Environmental awareness waiver included with agriculture form on plane
- Video in retail and rental shops also
- Reef Brochure distributed with every snorkel and scuba rental with contact info.

#### *Site visitation area/timing*

- Target deeper snorkel areas
- Limit visit during high tide at Ahihi-Kihau

#### *Physical solutions*

- Outlaw gloves
- Eliminate touch pools
- Barrier Line to prevent contact by kayak or boat
- Highlight and use hand signals – train new divers and educate current divers

#### *Education*

- More coral awareness seminars and Publicize!
- Mystery shopper and identify good role models
- Focus on kids – they will help adults to follow the rules
- Emphasize dangers to people as well as reef in education campaign
- Repetition is key – the more times the visitor hears it the more likely they are to comply. It's key that the boat that they are on is thorough with the reef preservation rules and enforcement

#### Lack of Interpretation

##### *Training naturalists*

- Guide Education – Naturalist Certification
- Marine option program & MCC require a certain amount of time act as interpreters in order to get their certificate
- Put the college students or someone trained on the boats to educate
- Create standardized interpreter training
- Generate funds to pay more naturalists.
- All guides have marine naturalist training
- Floating interpreters in kayaks, snorkeling

### *Outreach materials placement*

- Place information in visitor activity publications – distribute in major dive shops/ activity shops / hotels
- Partner with hotels to put info in rooms
- Government sponsored video on Hawaii Inbound aircrafts
- Info card of marine education given to people on airplane coming to Hawaii.

### *Training marine operators/businesses*

- Require education to all under water gear rentals (hotel pools, snorkel shops, boats)
- Educate crews – Mandatory

## **Honolua Bay Specific:**

### Lack of Education/Awareness

#### *Community*

- News stories on impacts/value
- Targeted PR campaign for resources and conservation (short commercials with concise messages)

#### *Legislators*

- Legislative lobbyists

#### *Students*

- Student education

#### *Visitors*

- Public Signs
- Community workshop(s)
- T.V awareness (visitor channel)
- Mini movie focused on marine life (docu-drama)
- Educate authors of tour books like “Maui Revealed”
- Visitor industry (agents, hotel G.Ms...) buy in to value and threats to marine resources

### Human contact/recreational over and misuse

#### *Boating*

- Trained naturalists on board boats
  - All H2O guides on shore
  - Crew
  - Scuba Instructors
- Conscientious Captains (Use of moorings and proper anchoring) – [no such thing as proper anchoring]
- Install more moorings [carefully managed]

- Smaller guide to tourist number [limit boat size and number of pax]
- Max occupancy number [capacity studies] [arrow to “regulation of # people”]

#### *Education/stewardship*

- Volunteer interaction
- Signage
- Briefings to guests/tourists about sustainability [“green guide” rating vendors for environmentally friendly practices]
- Get people excited/interested and they’ll want to preserve
- User fees/volunteer cleanup of sites

#### *Enforcement*

- Enforcement patrol [Underwater police]
- Regulation of # people
- Ban gloves

#### Alien Species

##### *Prevention*

- Nix the superferry –
- Monitor ship ballast –
- Controls on Mar. Orn. Collectors and research
- No dumping of boat waste by tour boats
- No dumping of fish tanks
- Identifying alien species

##### *Removal/Restoration*

- Quarantine () [of what]
- Annual cleanup

##### *Education*

- Education of/workshops [divers and operators (arrow) inspections of gear]  
[educate public]

#### Land based pollution (Development/Sedimentation/Nutrients)

##### *Sustainable alternatives*

- Install environmentally friendly toilets/trash recycle compost
- Encourage planting of soil de-toxing plants [native]
- Organic fertilizers /Pesticides
- Re-planting watersheds

##### *Education*

- Marked, designated, trailhead

### *Physical/technology*

- Moratorium on further development
- Pump out facilities [at harbors]
- Sediment of traps/fences
- Construction BMPs
- Wildlife Containment fences (i.e. pigs out) [controlling feral ungulates]
- Eliminate storm drains [organic/natural filters]
- Smoke free beaches (No butts!)

### Anchor damage/lack of proper moorings

#### *Research*

- Research Installing moorings (sand, concrete rock but no love rock)
- Research on impacts
  - (1o and 2o synergistic) prior to installation

#### *Enforcement*

- Enforce who can use and how many – LIMITS
- Implement a rotation schedule within operators who use moorings
- Hire a couple park rangers to monitor area (like Ahihi Bay)

#### *Other*

- Install more
- Funding thru user fees –
- More marine protected areas
- Public moorings (by permit)

### Lack of Education (visitors/tour operators)

#### *Visitors*

- Signage
- Handouts / Pamphlets – – – – [arrow – At car rentals]
- Public Service Announcements (Newspapers, TV, Radio, Airport /On plane / Visitor Ch. 7, Hotels, Gear rental stands)
- Interpretation/Tour guides on sites
- Info on cocktail napkins. Menus, etc. [creative!]
- Central, unavoidable information booth in places like Honolulu [Hanauma] Bay required
- Entrance fees
- Marine naturalists on tour boats

#### *Tour operators*

- Training of tour operators
- Required educational training / certification for access permits

- Mkt. Branding perks for certified operators –
- Training for concierges, activity desks, etc

## Appendix C. List of reports, books, studies related to Honolulu-Mokule'ia Marine Life Conservation District

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## **Appendix D. List of reports, books, studies related to Molokini Shoal Marine Life Conservation District**

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## **Appendix E. List of Acronyms**

ACOE: Army Corp of Engineers

AIS: Aquatic Invasive Species

BMP: Best Management Practice

CCMD: Climate Change and Marine Disease (LAS)

CORAL: Coral Reef Alliance

CRAMP: Coral Reef Assessment & Monitoring Program

CRWG: Coral Reef Working Group

CTAHR: University of Hawaii College of Tropical Agriculture and Human Resources

CZM: State of Hawaii, Coastal Zone Office (Department of Business, Economic Development and Tourism)

DAR: DLNR-Division of Aquatic Resources

DBEDT: State of Hawaii, Department of Business and Economic Development and Tourism

DLNR: State of Hawaii, Department of Land and Natural Resources

DOA: State of Hawaii, Department of Agriculture

DOBOR: DLNR-Division of Boating and Ocean Recreation

DOCARE: DLNR-Division of Conservation and Resource Enforcement

DOFAW: DLNR-Division of Forestry and Wildlife

DOH: State of Hawaii Department of Health

DOT: State of Hawaii Department of Transportation

EIS: Environmental Impact Statement

EPA: U.S. Environmental Protection Agency

FLASH: Fishing Local Action Strategy Hawaii

GPS: Global positioning satellites

HAR: Hawaii Administrative Rule

HRS: Hawaii Revised Statute

HTA: Hawaii Tourism Authority  
LAS: Local Action Strategy  
LBP: Land Based Pollution (LAS)  
MEDA: Maui Economic Development Association  
MEDB: Maui Economic Development Board  
MLCD: Marine Life Conservation District  
MLP: Maui, Land and Pineapple, Inc  
MMA: Marine Managed Area  
MPA: Marine Protected Area  
NOAA: National Oceanic and Atmospheric Administration  
NRCS: USDA-Natural Resources Conservation Service  
OCCL: DLNR-Office of Coastal and Conservation Land  
PMNM: Papahānaumokuākea Marine National Monument  
REEF: Reef Environmental Education Foundation  
RIR: Recreational Impacts to Reefs (LAS)  
SCUBA: Self Contained Underwater Breathing Apparatus  
UH: University of Hawaii  
USCRTF: United State Coral Reef Task Force  
USDA: U.S. Department of Agriculture  
USFWS: U.S Fish and Wildlife Service