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Hawai'i Marine Debris Action Plan 2012-2013



Dept. of Land and Natural Resources



NOAA Marine Debris Program



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HAWAI‘I MARINE DEBRIS ACTION PLAN 2012-2013

**by
NOAA Marine Debris Program
with marine debris partners in the State of Hawai‘i**

Updated December 2012

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The time, energy, and input of the many government agencies, non-governmental organizations, industry and academic partners, and private businesses making up the marine debris management community in Hawai'i was invaluable in the continued development and updating of this action plan for 2012-2013. This plan, which corresponds with the *Honolulu Strategy: A global framework for prevention and management of marine debris*, will guide all of our efforts over the next several years to address and reduce the environmental, socioeconomic, and human health and safety impacts of marine debris.

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ACRONYMS

5IMDC	Fifth International Marine Debris Conference
CRED	NOAA PIFSC Coral Reef Ecosystem Division
CRON	Coral Reef Outreach Network
CZM	State of Hawai‘i, DBEDT, Coastal Zone Management Program
DAR	State of Hawai‘i, DLNR, Division of Aquatic Resources
DBEDT	State of Hawai‘i, Department of Business, Economic Development, and Tourism
DFG	Derelict fishing gear
DLNR	State of Hawai‘i, Department of Land and Natural Resources
DOBOR	State of Hawai‘i, DLNR, Division of Boating and Ocean Recreation
DOCARE	State of Hawai‘i, DLNR, Division of Conservation and Resources Enforcement
DOH	State of Hawai‘i, Department of Health
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
GPS	Global Positioning System
HI-MDAP	Hawai‘i Marine Debris Action Plan
HIHWNMS	Hawaiian Islands Humpback Whale National Marine Sanctuary
HPD	Honolulu Police Department
HPU	Hawai‘i Pacific University
ICC	International Coastal Cleanup
IMDCC	Interagency Marine Debris Coordinating Committee
MDRPRA	Marine Debris Research, Prevention, and Reduction Act
MDP	Marine Debris Program
MHI	Main Hawaiian Islands
MS4	Municipal Separate Storm Sewer System

NASBLA	National Association of State Boating and Licensing Administration
NGO	Nongovernmental organization
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWHI	Northwestern Hawaiian Islands
NWR	National Wildlife Refuge
PICO	EPA Pacific Islands Contact Office
PIFSC	Pacific Islands Fisheries Science Center
PMNM	Papahānaumokuākea Marine National Monument
POP	Pacific Ocean Producers Fishing and Marine
PSA	Public service announcement
UH	University of Hawai‘i
USCG	U.S. Coast Guard
WPFMC	Western Pacific Regional Fisheries Management Council

1.0 INTRODUCTION

Marine debris is an ongoing problem worldwide. With increased use of synthetic materials like plastic, marine ecosystems have suffered from the impacts of marine debris. Tons of derelict fishing gear and trash may be found strewn along otherwise pristine Hawaiian beaches. Hawaiian monk seals, green sea turtles, and humpback whales become entangled in and injured from derelict fishing nets. These images highlight the need for increased marine debris efforts throughout the Hawaiian archipelago.

The Hawai‘i Marine Debris Action Plan (HI-MDAP) was built on the significant ongoing and past efforts of Hawaii’s marine debris community. The National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program (MDP) and the U.S. Environmental Protection Agency (EPA) facilitated the development of the HI-MDAP with active participation and input from Hawaii’s marine debris community, from government agencies, nongovernmental organizations, academic institutions, and private entities.

“The problem of marine debris can be dealt with effectively only by ensuring a comprehensive approach that is local in scale and global in scope, directed at source prevention, and establishes an educated community that can be empowered to action.” (NOAA, 2008)

1.1 Purpose of the Plan

The overall purpose of the HI-MDAP is to establish a comprehensive framework for strategic action to reduce the ecological, health and safety, and economic impacts of marine debris in Hawai‘i by 2020. Due to the complexity of marine debris issues, there is a role for everyone in the implementation of this plan, including the private citizen who picks up litter from our beaches and watersheds; federal, state, and county government agencies that are mandated to address the threat of marine debris; private businesses and industry that get involved to serve the communities in which they operate; and nongovernmental and academic organizations that support a wide range activities like cleanup, research, education, and outreach. The HI-MDAP establishes threat reduction goals and strategies to promote coordinated action to address the significant threats posed by marine debris in the Hawaiian archipelago.

1.2 Background

The original HI-MDAP was developed over a three year period from 2006 to 2009 through a collaborative process involving the multitude of Hawai‘i marine debris stakeholders from governmental, non-governmental, academic, industry, and private business partners from the across the state. In January 2010, the plan was released at a roll out ceremony that was attended by over 70 partner representatives, as well as supporting elected officials. The HI-MDAP was designed as a living document to be routinely updated every two years as the process of addressing Hawaii’s marine debris issues evolves. As such, the original HI-MDAP included a two-year activity and implementation plan for the January 2010-December 2011 timeframe. At the conclusion of each two-year period, the plan will be updated to both incorporate the results from the previous implementation period and provide planned activities for the next two years.

This updated HI-MDAP was prepared for the second two-year cycle for January 2012-December 2013. A workshop was held on April 26 – 27, 2012 to bring HI-MDAP partners to review accomplishments of the past two years, identify strategic adjustments to the plan, and detail planned activities for the next two years. A summary of the changes made to the HI-MDAP (2010-2011) resulting from the recent update is provided in Appendix A.

1.3 Global Marine Debris Strategy

In March 2011, NOAA, in collaboration with the United Nations Environment Programme, organized and hosted the Fifth International Marine Debris Conference (5IMDC). The five-day conference was held in Honolulu, Hawai‘i and brought together 440 participants representing 38 countries. A significant output of the conference was the development of the *Honolulu Strategy: A Global Framework for the Prevention and Management of Marine Debris (Honolulu Strategy)* (NOAA and UNEP, 2011). The *Honolulu Strategy* is a framework for a comprehensive and global effort to reduce the ecological, human health, and economic impacts of marine debris globally. The *Honolulu Strategy* is intended for use as a:

- Planning tool for developing or refining spatially or sector-specific marine debris programs and projects
- Common frame of reference for collaboration and sharing of best practices and lessons learned

- Monitoring tool to measure progress across multiple programs and projects

The structure and goals of the HI-MDAP align to those of the *Honolulu Strategy*, which makes activity planning and progress tracking a simpler process. This global marine debris strategy, as with the HI-MDAP, may be used by Hawaii’s local marine debris community to strategically plan for future activities and track progress at multiple levels (i.e., regionally and globally).

1.4 Marine Debris in the Hawaiian Archipelago

Marine debris in Hawai‘i takes a variety of forms, comes from our own islands as well as from across the Pacific, and causes damage to our natural resources and to human activities. Marine debris is defined as any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes (NOAA and DHS, 2009). It may enter the environment directly from a ship, or indirectly when washed out to sea from rivers, streams, or storm drains. Marine debris includes a wide variety of items, including plastic bags, glass bottles, rubber slippers, derelict fishing gear, and abandoned or derelict vessels. Activities that create marine debris occur both on land and on the ocean.

Ocean-based sources of marine debris include fishing vessels, recreational boats, cargo ships, and other vessels. Marine debris, from land or sea, may result from accidental loss of gear or cargo, illegal discharge, or abandonment of vessels themselves. Fishing gear may be lost from commercial fishing vessels as well as from recreational boats or shore-based fishing. Cargo lost overboard from freighters, cruise ships, and other vessels pose serious threats to marine navigation.

Waste generated on land can be blown or washed down to the shoreline and washed out to sea. Activities on land that can create marine debris include littering, dumping in rivers and streams, fishing from shore, improper waste management, industrial losses such as spillage of plastic resin pellets during production, transportation, and processing, and natural disasters (e.g., tsunami). Storm water that flows along streets or along the ground can carry street litter into storm drains. Storm drains carry this water and debris to a nearby river, stream, canal, or even directly to the ocean. Marine debris from

stormwater runoff includes street litter (e.g., cigarette butts and filters), food packaging, beverage containers, medical items (e.g., syringes), and other material that might have washed down a storm drain. During storms or other periods of strong winds or high waves, almost any kind of trash can be carried into the ocean.

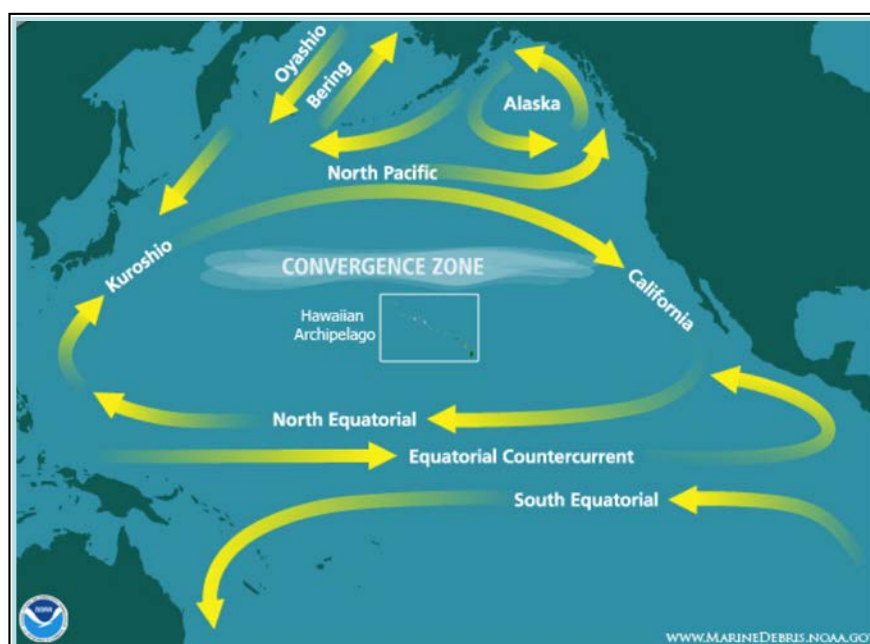


Figure 1. Location of the Hawaiian archipelago in the North Pacific Subtropical Gyre.

Much of Hawaii’s marine debris, especially derelict fishing gear (DFG), is generated from distant sources. Hawaii’s geographic position, at the center of the North Pacific Subtropical Gyre (Figure 1), has the unfortunate distinction as a hotspot for the aggregation of marine debris. The North Pacific Subtropical

Gyre flows in a clockwise pattern and consists of four prevailing ocean currents: the westward-traveling North Equatorial Current, the northward Kuroshio Current, the eastward North Pacific Current, and the southward California Current. This gyre, along with other oceanographic and atmospheric features in the North Pacific, entrains trash and derelict fishing gear from the entire North Pacific Ocean and beyond. Across the Pacific, derelict fishing gear is now recognized as a major environmental threat to coastal and nearshore areas. The Hawaiian archipelago acts as a giant comb, collecting large pieces of marine debris in the shallow reefs and on the beaches across the entire island chain, especially along the windward, or east-facing, shores (Figure 2).



Figure 2. Derelict fishing gear accumulation along the coastline of the main Hawaiian Islands (results of 2006 NOAA aerial survey).

Marine debris results in ecological, human health and safety, and economic impacts in Hawai‘i. Ecological impacts on seabirds, Hawaiian monk seals, green sea turtles, and other coastal and marine species may occur from ingestion of and entanglement in marine debris. Large floating marine debris such as DFG continues to ensnare marine life (also called ghost fishing) and in at least one case to date has served as a vector for the introduction of

alien species (Zabin et al., 2004). Marine debris causes physical abrasion, breakage, and shading of coral reef habitat. The few studies conducted on reefs outside of Hawai‘i indicate that impacts to sessile marine invertebrates include damage and death (Chiappone et al., 2005). Additionally, entanglement with derelict monofilament fishing line has been shown to cause significant coral mortality (Asoh et al., 2004). These effects have been shown to create long-lasting changes to the reefs they impact (Precht et al., 2001).

One of the main types of marine debris is plastic marine debris. “Plastic” is a common term used to describe a synthetic material made from a wide range of manmade or partially manmade chemical compounds (polymers). Due to the versatility of the material, plastics are used in a large and growing number of applications and industries including packaging, building and construction, transportation, medical and health, electrical and electronics, agriculture and

sports and leisure. Global plastics production increased by 10 million tons from 2010 to around 280 million tons in 2011, continuing an average growth pattern of approximately 9% per year (PlasticsEurope, 2012). Currently there is no accurate estimate of how much plastic marine debris enters the ocean annually. Some estimates exist, but none are confirmed.

Plastic marine debris is found in varying shapes and sizes, from in-tact plastic bottles, to microscopic plastic pieces. These tiny plastic debris pieces, less than five millimeters (<5mm) in length, are known as microplastics. Types of small plastic marine debris include not only microplastics, but in-tact small plastic pieces such as pre-production plastic pellets or plastic micro-scrubbers found in some facial care product as well as small bits of broken down plastic items. As plastic is weathered, it degrades into smaller and smaller pieces, some of which may eventually become microplastics. This process takes longer in the ocean than on land due to lower temperatures. Full degradation into carbon dioxide, water, and inorganic molecules is called mineralization (Andrady 2003). Based on research to date, most commonly used plastics do not mineralize.

Plastic debris has the potential to harm wildlife directly through ingestion. Studies have shown that marine life, including sea birds, sea turtles, fish, marine mammals, and sharks eat plastic (Auman et al. 2004; Barreiros and Barcelos 2001; Baird and Hooker 2000; Boerger et al. 2010; Cliff et al. 2002; Possatto et al. 2011). The ingestion of inert, indigestible marine debris has been documented to result in obstruction of the digestive tract, mouth, and stomach lining of various species. Some obstructions can prevent organisms from taking in food, which can result in nutrient deficiency and eventual starvation (Pierce 2004).

Plastic debris absorbs persistent organic pollutants (POP), such as polychlorinated biphenyls (PCB), 100,000 to 1,000,000 times the levels found in seawater (Mato et al. 2001). Many POPs are known endocrine disruptors. Some studies



Photo 1. Seabirds such as the Laysan albatross, may ingest plastic debris. Photo courtesy of C. Fackler, NOAA ONMS.

have demonstrated that it is possible for PCBs to indirectly transfer from contaminated plastic to the tissues of a living organisms like the lugworm, *A. marina* (Teuten et al. 2007). The science is not clear on the added risk that plastic marine debris contributes to the availability and transfer of chemicals in the marine food web, but further research is currently being conducted to examine the links of POPs to the food chain.

Marine debris is a navigation hazard, posing risks to human health and safety by disabling vessels at sea. While the impact of marine debris on navigation has yet to be quantified, some data has been collected by the NOAA Pacific Islands Regional Observer Program on fishing vessel interaction with marine debris at sea. Many times, this requires crew to dive under boat to remove debris wrapped around a propeller. This not only endangers human health and safety, but also could potentially result in economic loss from lost fishing time (Hospital and Morishige, 2010). In general, the economic impacts of marine debris are not well quantified.

The issue of marine debris in Hawai‘i has garnered increasing attention over the last decade and even more within the last few years. In 1982, NOAA began to address this pervasive problem by incorporating marine debris removal from beaches into its activities in the Northwestern Hawaiian Islands (NWHI). In-water and shoreline removal of derelict fishing gear began in 1996. Since then, 700+ tons of derelict fishing gear have been removed from the NWHI, the majority of which has been incinerated to generate energy for O‘ahu residents (Figure 3).

In 1998, a marine debris group consisting of federal, state, and local government agencies and industrial, academic, and nongovernmental organizations formed around the need to collectively address the marine debris issue in the Northwestern Hawaiian Islands. Since then, this group of partners has grown and the removal effort has gained momentum, expanding to include projects in the main Hawaiian Islands and incinerating marine debris to create electricity through Hawaii’s Nets to Energy Program. One of the group’s newest partners is the NOAA Marine Debris Program (MDP), which was created in 2005.

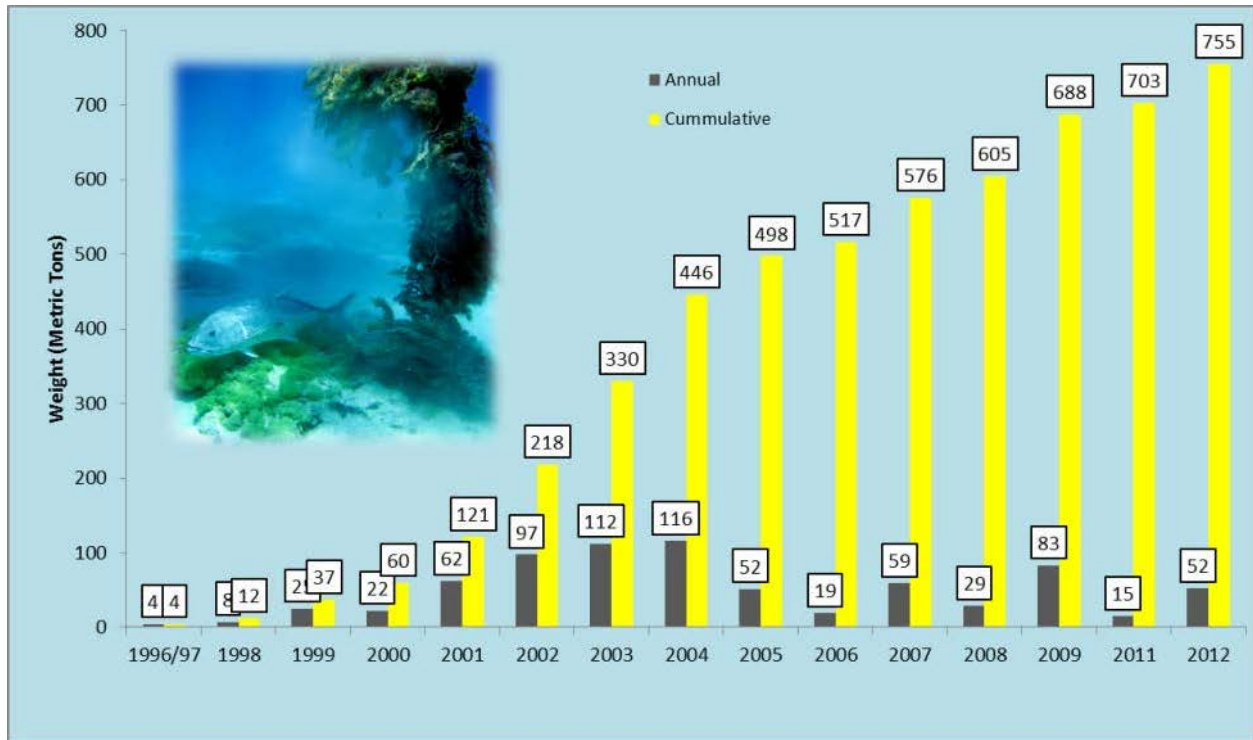


Figure 3. Quantity of derelict nets and other debris removed from the Northwestern Hawaiian Islands, 1997-2009 (NOAA PIFSC CRED, unpublished). Graph courtesy of NOAA PIFSC CRED.

In addition to these group efforts, numerous agencies and organizations across the state have been involved in addressing marine debris. From small beach cleanups to the multi-partner Hawai'i Nets to Energy Program, many activities and entities are addressing marine debris in Hawai'i. Despite extensive efforts over the past 10 years, marine debris continues to be a chronic threat to Hawaii's marine ecosystem as well as human health, navigation safety, and the economy. A more strategic approach is needed to maintain efforts to reduce the backlog of marine debris as well as increase efforts for debris prevention.

2.0 PLAN DEVELOPMENT

The Marine Debris Research, Prevention, and Reduction Act (MDRPRA) was signed into law on December 22, 2006. The MDRPRA established a Marine Debris Prevention and Removal Program (Marine Debris Program) within the National Oceanic and Atmospheric Administration (NOAA), provided directives for the U.S. Coast Guard (USCG), and re-established the Interagency Marine Debris Coordinating Committee (IMDCC). To fulfill certain directives outlined in the Act, NOAA organized regional workshops in marine debris “hot spot” areas—regions where marine debris activities have been occurring for many years and where marine debris has adversely affected trust resources or navigation. The HI-MDAP was developed with participation from Hawaii’s marine debris community, including government agencies, academic institutions, nongovernmental organizations, and the private sector. The individuals and organizations that contributed to the development of and provide regular updates for the plan are listed in Appendix B.

2.1 *Engaging Stakeholders*

In 2007 and 2008, the NOAA MDP, with the assistance of EPA Region 9, organized a series of meetings and workshops to bring together government, nongovernmental, academic, and private sector stakeholders engaged in marine debris issues in Hawai‘i. An initial meeting with members of Hawaii’s marine debris community was conducted on June 21, 2007. Twenty-one marine debris experts in Hawai‘i—from state and federal government agencies, academia, and the private sector—convened to discuss marine debris issues, potential topics for a Hawai‘i regional workshop, and anticipated outputs from the workshop. Participants highlighted the need for a comprehensive approach and strategies to address marine debris issues that include the following topic areas:

- Research and assessment
- In-water debris removal and prevention
- Beach cleanup
- Land-based debris prevention
- Outreach and education

In addition, participants recommended that the Hawai‘i workshop result in specific outputs, such as a preliminary plan to prioritize marine debris efforts

in the main Hawaiian Islands (MHI) as well as the Northwestern Hawaiian Islands (NWHI).

The Hawai‘i Marine Debris Workshop was held on January 16 and 17, 2008. Thirty-four members of the marine debris management community in Hawai‘i, from federal, state, and local government agencies, nongovernmental organizations, academia, and the private sector, met to identify and prioritize a range of ongoing and potential new actions for the next 10 years. The objectives of the workshop were to:

- Share current best practices, ongoing activities, and success stories from experiences in both the main Hawaiian Islands and the Northwestern Hawaiian Islands.
- Identify marine debris priority actions for the next 10 years.
- Begin the development of a Hawai‘i Marine Debris Action Plan.
- Obtain commitment from participants to stay engaged in plan development and implementation.

Following the Hawai‘i Marine Debris Workshop, three one-day workshops were held to further characterize new actions needed for each strategy. These topic area-specific planning workshops were held in 2008 on October 22 (Outreach and education), November 5 (Land-based debris prevention and Beach cleanup), and November 14 (Research and assessment and In-water removal and prevention). Participants, working in small groups, discussed priority actions identified in the January workshop as well as additional actions and prepared detailed descriptions of each action using standardized templates.

The plan was then rolled out in a half day event on January 12, 2010 in Honolulu, HI. The event was attended by over 75 partners and elected officials.

2.2 Defining Threat Reduction Goals and Strategies

Threat reduction goals and strategies are important components of developing effective actions to address marine debris. Threat reduction goals and strategies are two key components of a natural resource management planning tool being undertaken by a variety of groups around the world (see Figure 4).

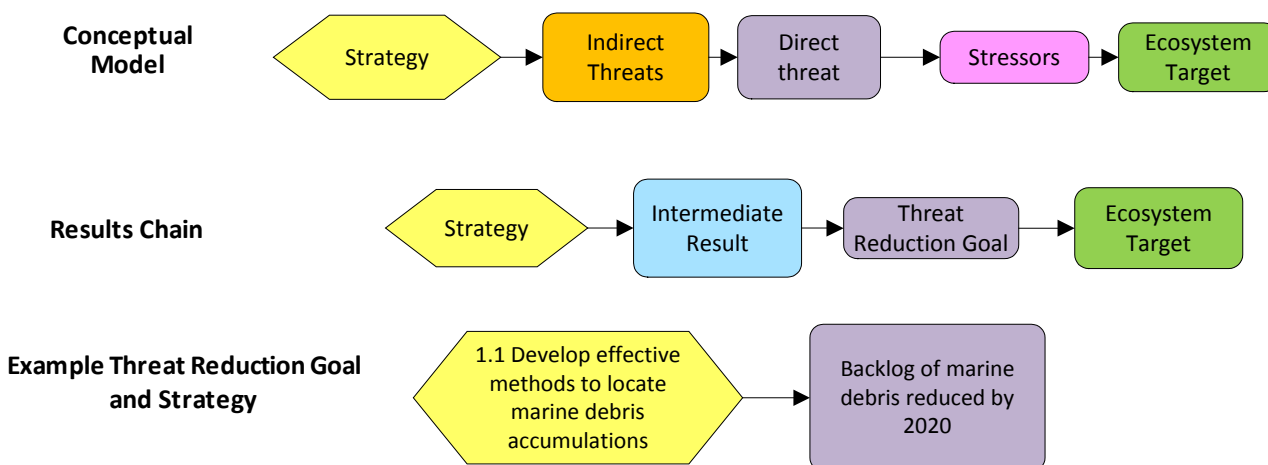


Figure 4. Schematic diagram of a conceptual model and results chain and example threat reduction goal and strategy pair.

The marine debris results chains (Appendix C) are basically diagrams that show in detail how a particular action will lead to some desired result. They are depicted as a chain of causal statements that link short-, medium-, and long-term results in an “if...then” fashion. For example, if more people replace conventional with hybrid vehicles, then the amount of CO₂ emissions will decrease. For planning purposes, a results chain clarifies assumptions about how strategies will contribute to reducing important threats, leading to the conservation of ecosystem targets.

Results chains are often derived from conceptual models. A conceptual model is another tool that helps depict the relationship among various threats believed to impact one or more ecosystem targets (Figures 5 and 6). Over the last two decades, conceptual models have been used in a variety of fields including international development, public health, and environmental management. Conceptual models have been used in an environmental context to depict fate and transport of contaminants through the ecosystem, such as through bioaccumulation. Currently, this tool is being used as part of the conservation planning cycle to visually depict the causal links between direct and indirect threats on threatened and endangered species, habitats, and other components of an ecosystem of interest (FOS, 2009).

Ecosystem targets in the Marine Debris Conceptual Model include coastal and marine species, coral reefs, human health and safety, and the economy (see Figures 5 and 6). Direct threats to these targets include accidental loss of

fishing gear, illegal discharge of fishing gear and solid waste at sea, abandoned vessels, continuing backlog of marine debris, debris generated by severe storms, improper disposal of solid waste in streams, rivers, and stormwater systems, and litter from beachgoers. Indirect threats include social, political, economic, and technological constraints or obstacles contributing to the direct threats.

Results chains differ from conceptual models in that conceptual models show the state of the world before a particular action takes place, while a results chain shows the state of the world expected to result from the proposed strategy. Results chains are similar to the logic models used by many organizations, but results chains have the added benefit of showing more detail and the direct relationship between one result and another.

2.3 Updating the Plan

On April 26 and 27, 2012, the NOAA MDP hosted a HI-MDAP workshop held in Honolulu. Over forty participants attended from across the State to share accomplishments from the past two years and plan for Jan. 2012–Dec. 2013. The objectives of the workshop were to:

- Provide an opportunity for the marine debris community in Hawai‘i to network and share experiences.
- Review the implementation status of the HI-MDAP (Jan. 2010–Dec.2011).
- Identify existing opportunities and challenges.
- Identify synergies to advance marine debris actions in order to work better together.

For those not able to attend the workshop, a request to provide accomplishments and planned activities was made (Appendix B). The information provided at the workshop and in response to the request was compiled and is provided in: Appendix D – Accomplishments 2010–2011 and Appendix E – Planned Activities 2012–2013. Another key output of the workshop was the signing of the Declaration of Support for the Hawai‘i Marine Debris Action Plan (Appendix F). By signing the declaration, members of the Hawai‘i marine debris community agreed to support the goals and work outlined in the HI-MDAP and the *Honolulu Strategy*, and to meet every two years to develop an implementation status report and activity plan for the next two-year period.

3.0 Conceptual Model of Threats from Marine Debris

In order to capture the complexities of the threats from marine debris in the Hawaiian archipelago, a conceptual model was developed to illustrate causal links between the types, sources, and, locations of marine debris in the environment with the direct and indirect threats on specific ecosystem targets in Hawai‘i (Figures 5 and 6). This conceptual model was developed to facilitate the identification of threat reduction goals and strategies to reduce the impacts of marine debris in the Hawaiian archipelago and to document the assumptions made in developing the strategies to address marine debris threats.

3.1 *Ecosystem Targets and Stressors*

The ecosystem targets for the HI-MDAP include coastal and marine species, coral reefs, human health and safety, and the economy. Ecosystem targets are components of an ecosystem that are the focus of planned strategies or actions. Stressors are the biophysical consequences of a direct threat on an ecosystem target. These ecosystem targets and stressors are described below and shown in green and pink boxes in Figures 5 and 6.

Coastal and Marine Species: Species in Hawai‘i particularly threatened by marine debris include endangered Hawaiian monk seals and threatened green sea turtles. Ingestion and entanglement are primary stressors on these species; however, increasing evidence suggests that degraded plastics may affect biological processes and enter the food chain.

The Hawaiian monk seal (*Monachus schauinslandi*) is one of the rarest marine mammals in the world. Hawaiian monk seals are distributed predominantly in six NWHI subpopulations at French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Reef, and Midway and Kure Atolls. Small numbers also occur at Necker, Nihoa, and the main Hawaiian Islands. The current estimate of the total remaining population size is approximately 1,200 individuals (NOAA, 2009). Hawaiian monk seals become entangled in derelict fishing gear and other marine debris at rates higher than reported for other pinnipeds (Henderson, 2001). A total of 268 cases of seals entangled in fishing gear or other debris were observed through 2006 (Henderson, 2001; NMFS, unpubl. data), including seven documented deaths resulting from entanglement in fisheries-related debris.

Threatened green sea turtles are distributed along the coastlines of O‘ahu, Moloka‘i, Maui, Lana‘i, and Hawai‘i as well as at Lisianski Island and Pearl and Hermes Reef. Entanglement and ingestion of marine debris were identified as a primary threat to green sea turtle recovery (NOAA and USFWS, 1998).

Coral Reefs: Coral reefs throughout the Hawaiian archipelago serve as the primary habitat for numerous marine species. Coral reefs are abraded, broken, and shaded by marine debris. They can also be heavily impacted by aquatic invasive species that are introduced via marine debris.

Human Health and Safety: From broken glass on a beach to disentangling marine debris from a vessel’s propeller, marine debris is a threat to human health and safety.

Economy: Marine debris threatens the economy of coastal areas that depend on tourism. Litter on beaches threatens degrades the quality of the tourism experience. State and county government agencies must continue to allocate funds to remove marine debris and clean up beaches. Marine debris also results in economic impacts to commercial fishers when marine debris fouls gear or fishing vessels and to the maritime transportation industry when debris affects vessel operations at sea. There are likely other types of economic impacts; however there is a paucity of research in this particular impact area.

3.2 *Direct and Indirect Threats*

Marine debris poses a variety of direct and indirect threats to the ecosystem by stressing marine species and habitats as well as human health, safety, and the economy. Direct threats are human actions or unsustainable uses that immediately degrade one or more ecosystem targets. These direct threats stress the various components of the ecosystem. Indirect threats are underlying causes or drivers of direct threats and are often “entry points” for conservation strategies. The causal linkages of threats and ecosystem targets are summarized below and shown in orange, purple, and pink boxes, respectively, in Figures 5 and 6.

Accidental loss of fishing gear or illegal discharge of fishing gear and solid waste at sea: As an example of the relationship between direct and indirect threats, loss of fishing gear is a direct threat, but faulty gear or fishing

practices that led to its loss would be indirect threats. As a result of those indirect threats, fishermen must cut the gear from the vessel and release it to the sea for health and safety reasons. Another direct threat and source of marine debris is illegal discharge of gear and solid waste at sea. Damaged gear and solid waste are sometimes illegally discharged at sea during a variety of maritime operations, including from fishing vessels, cruise ships, and cargo ships. Factors (i.e., indirect threats) contributing to illegal discharge include, limited capacity to store damaged gear and solid waste on vessels at sea and the cost for proper on-shore disposal once the vessels return to port. In addition, fishermen and other vessel operators may be unaware of laws to prevent pollution from ships or to prohibit unregulated ocean dumping, and the adverse ecological impacts and navigational hazards they create by illegal discharge or dumping. Lastly, enforcement of these laws is difficult at sea, particularly in international waters.

Lack of removal of backlog of marine debris: Marine debris, including derelict fishing gear, lost cargo, and other solid waste, has accumulated in the North Pacific as a result of years of accidental loss and illegal discharge from ships. This backlog of marine debris washes up on to beaches and reefs along the length of the Hawaiian archipelago, especially on the windward side of these islands. The North Pacific Ocean covers an enormous area and at sea-detection and removal are difficult and costly.

Abandonment of vessels: Abandoned vessels are sources of marine debris. These vessels can abrade benthic habitats creating disturbed areas that can be settled by opportunistic or alien species thereby altering ecosystem structure. The incidence of vessel abandonment is exacerbated by the high cost of removing vessels that no longer operate. Further, vessel insurance is often insufficient, or nonexistent, to cover the cost of removing a vessel that no longer operates.

Debris from improper disposal of solid waste on land: Marine debris is generated from regulated and non-regulated land-based activities. Improperly disposed-of solid waste on land can eventually be carried by stormwater sewer systems, canals, and streams, to beaches and the sea. Improper disposal of solid waste may result from lack of awareness of the impacts of marine debris, combined with the increasing use of plastics and other nonbiodegradable products as well as a lack of recycling and disposal options.

Solid waste is conveyed to waterways by a multitude of unregulated nonpoint sources as well as permitted/regulated stormwater discharges from municipal separate storm sewers in urban areas. National Pollutant Discharge Elimination System (NPDES) stormwater permits have not been utilized to address solid waste discharges to waterways until recently and provide substantial opportunities to address land-based solid waste discharges to waterways. Finally, in urban areas, engineering solutions are often needed to capture and prevent land-based debris from entering waterways; however, the use of such devices can be limited by the initial cost and maintenance requirements.

Debris from natural disasters: Extreme natural events, including storms, hurricanes, and tsunamis, can generate land-based debris and can transport debris floating at sea onto beaches and reefs nearby or overseas. In addition, disaster-generated debris has the potential to transport alien species. Of particular concern are debris items, such as a dock, with lengthy residence time in the nearshore waters of another country or state and thus biofouling of non-pelagic alien species. A natural disaster may result in loss of life, destruction of property, and loss of critical infrastructure such as power and water. The removal of marine debris may be a low priority after a storm event, and rapid removal is impeded by the cost, lack of capacity, and lack of clear mandates and procedures for marine debris response.

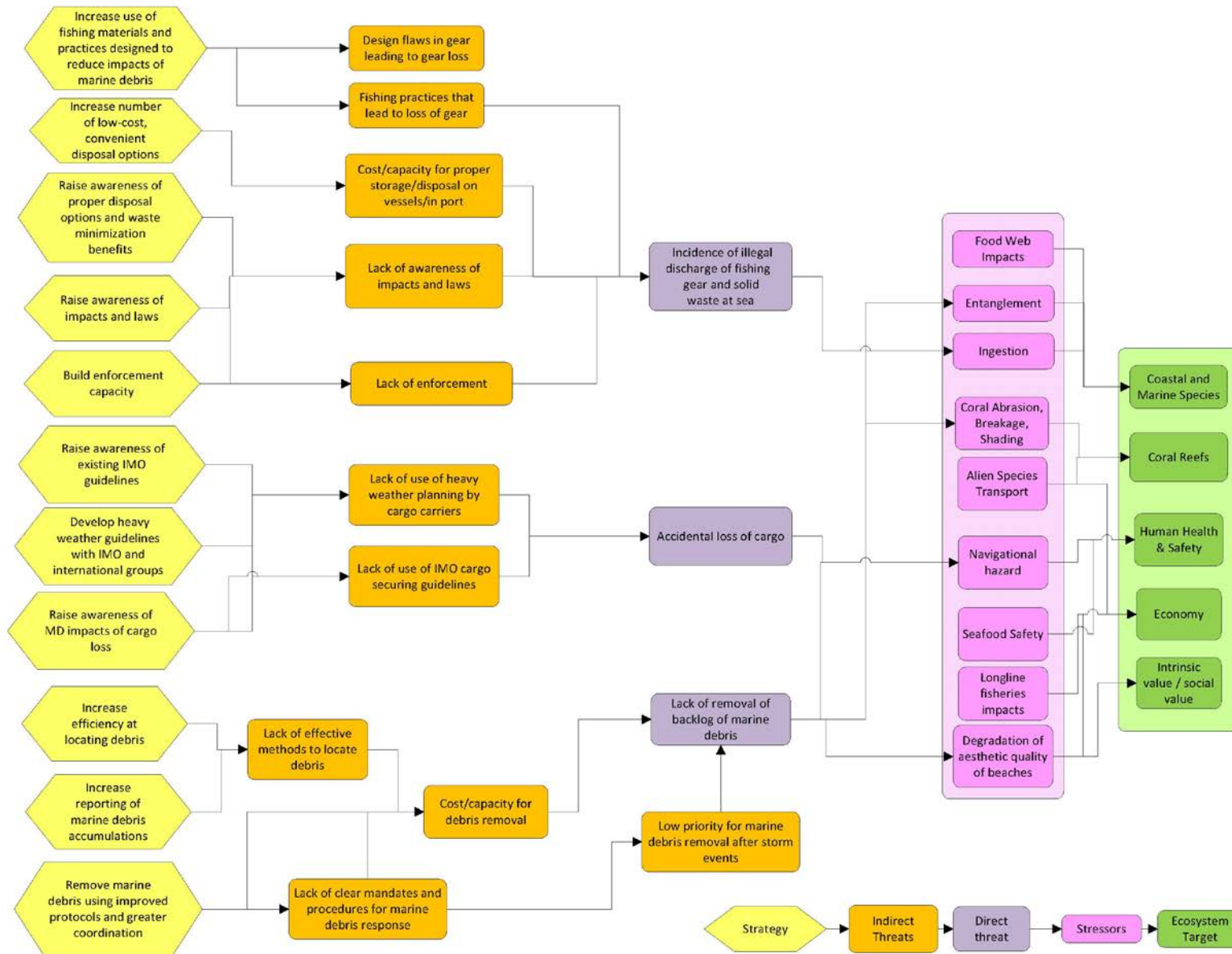


Figure 5. Conceptual model of direct and indirect threats of marine debris in Hawai‘i - Part 1.

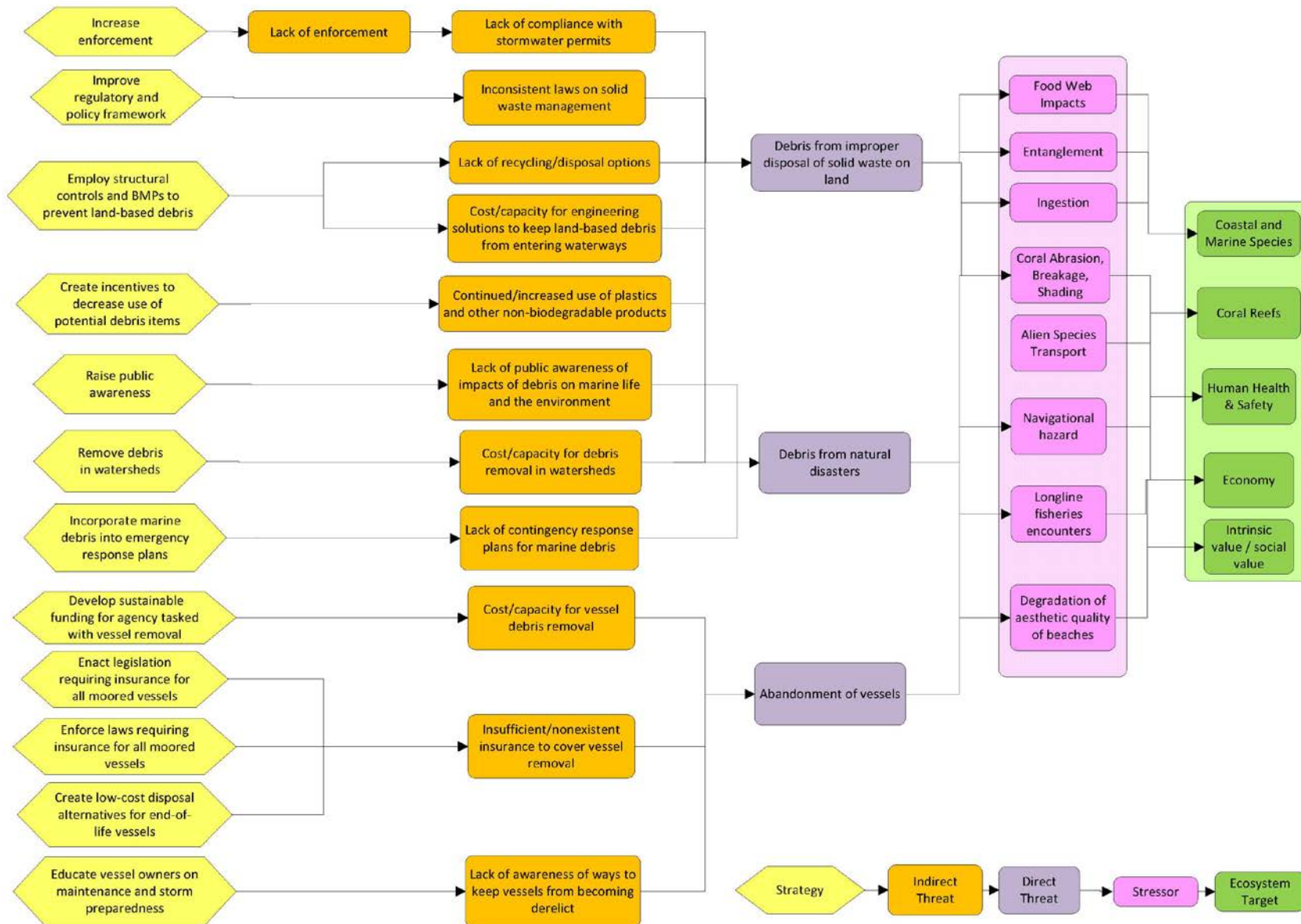


Figure 6. Conceptual model of direct and indirect threats of marine debris in Hawai‘i - Part 2.

4.0 THREAT REDUCTION GOALS AND STRATEGIES TO REDUCE IMPACTS OF MARINE DEBRIS

The overall goal of the HI-MDAP is to reduce ecological, health and safety, and economic impacts of marine debris in Hawai‘i by 2020. A set of threat reduction goals and strategies (Figure 7) to achieve this overarching goal was defined based on a consideration of past and ongoing actions and the conceptual model described in Figures 5 and 6. Each strategy is causally linked by a set of intermediate results that lead to the threat reduction goal. The threat reduction goals and key strategies are described below and illustrated in results chains in Appendix C. These results chains represent a set of assumptions that describe the expected outcomes if the strategies are carried out. Results chains also provide a tool to monitor performance of plan implementation through the year 2020.

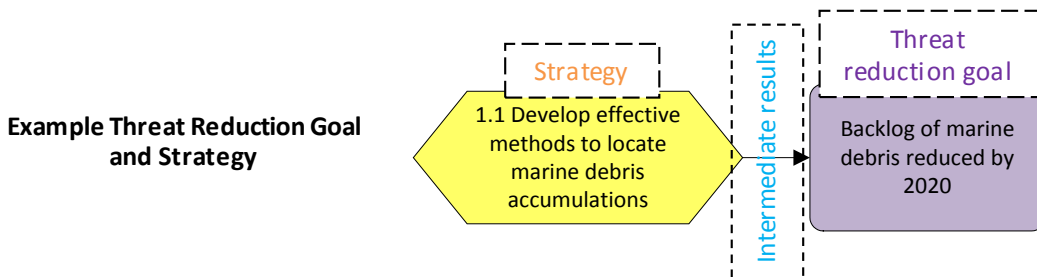


Figure 7. Threat reduction goal and strategy pair

The HI-MDAP has a set of four general results chains by goal. Each is described in more detail below. Site-specific results chains will be created, as needed, by organizations and agencies as activities and projects are carried out. These site specific results chains will build upon a strategy within one of the four general results chains. Table 1 provides a listing of the HI-MDAP goals and strategies. Based on information provided by HI-MDAP partners at the April 2012 workshop, a few changes were made to the strategies. See Appendix A for more information on these changes.

Table 1. Summary of HI-MDAP (2012-2013) Goals and Strategies

Goal 1: Backlog of Marine Debris as Sea Reduced
Strategy 1.1: Develop effective methods to locate marine debris accumulations
Strategy 1.2: Develop effective systems for reporting marine debris accumulations
Strategy 1.3: Develop capacity and coordination mechanisms for marine debris removal
Goal 2: Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased
Strategy 2.1: Conduct education and outreach to ocean users on marine protection laws, including laws to prevent pollution from ships, ocean dumping laws and proper waste management at sea.
Strategy 2.2: Provide low-cost and convenient disposal options for gear and solid waste
Strategy 2.3: Increase use of fishing materials and practices designed to reduce impacts of marine debris
Strategy 2.4: Strengthen marine protection laws, including ship pollution prevention and ocean dumping laws
Strategy 2.5: Build capacity to monitor and enforce against illegal discharge of solid waste at sea
Goal 3: Number of Abandoned and Derelict Vessels Decreased
Strategy 3.1: Educate vessel owners on maintenance and maritime preparedness
Strategy 3.2: Develop capacity and coordination mechanisms for abandoned vessel removal and disposal
Strategy 3.3: Develop sustainable funding mechanism and resources for vessel removal and disposal
Goal 4: Land-based Debris in Waterways Reduced
Strategy 4.1: Conduct education and outreach targeted to specific audiences
Strategy 4.2: Improve effectiveness of stormwater permits
Strategy 4.3: Build capacity to enforce all appropriate laws to reduce land-based discharge of solid waste
Strategy 4.4: Employ structural controls and BMPs to prevent land-based debris from entering the ocean
Strategy 4.5: Increase coordination and targeted cleanups in watersheds and beaches
Strategy 4.6: Decrease use of potential debris items

4.1 Goal 1 - Backlog of Marine Debris Reduced

Reduction in the backlog of marine debris at sea and on reefs and beaches will reduce stressors on all ecosystem targets. Results chains were developed for Goal 1 by linking strategies with a set of intermediate results (Appendix C, Figure C-1). Three strategies are identified to achieve this goal:

Strategy 1.1: Develop effective methods to locate marine debris accumulations

Strategy 1.2: Develop effective systems for reporting marine debris accumulations

Strategy 1.3: Develop capacity and coordination mechanisms for marine debris removal

Strategy 1.1: The enormous area of the North Pacific and remoteness of the Hawaiian archipelago require increased efficiency for locating marine debris. Research activities are needed to design, test, and develop standardized and effective survey methods that can be used effectively for detection at sea, on reefs, and on beaches. The use of satellite technology and unmanned and manned aerial surveys are some of the survey methods that need to be explored to increase the efficiency and lower the cost of locating and tracking marine debris. Using a combination of methods, we will be able to reduce the physical area to be surveyed and target removal operations more effectively. To that end, an at-sea detection strategy for derelict fishing gear in the North Pacific Ocean has been developed (McElwee et al., 2012).

Strategy 1.2: Commercial and recreational fishermen, cargo ships, beachgoers, and a variety of other ocean users observe marine debris accumulations on beaches, nearshore areas, and at sea. The development of effective marine debris reporting systems is needed to increase the ability of these ocean users to report the location of significant marine debris accumulations. Increased reporting of marine debris accumulations must be facilitated through education and outreach activities targeted to appropriate audiences and supported by clear and responsive reporting mechanisms. With the increased efficiency of locating debris combined with increased reporting, it is assumed that the cost of locating and removing marine debris will be reduced.

Strategy 1.3: The removal of the backlog of marine debris will require continuous support into the foreseeable future until the backlog is substantially reduced and debris prevention measures are implemented throughout the North Pacific. The removal of derelict fishing gear and other

large debris on beaches, reefs, and at sea is a costly endeavor that requires specialized skills and equipment. Agencies responsible for debris removal in coastal areas are underfunded and often lack the proper equipment. This causes delays in debris removal, especially following natural disasters when public resources are focused on human health and safety and maintaining services. If we increase coordination and cost sharing among responsible entities, the effectiveness of marine debris removal operations will be increased.

With the establishment of the Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands, enhanced coordination among co-trustee agencies—NOAA, USFWS, and the State—will facilitate the reduction of marine debris that threatens protected species such as the Hawaiian monk seal and green sea turtle. In the main Hawaiian Islands, the development of a response protocol for marine debris removal is needed to improve coordination among primary and support responders to reports of significant marine debris.

4.2 Goal 2 - Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased

Reducing the incidence of illegal discharge of solid waste and fishing gear at sea will reduce stressors on all ecosystem targets. Results chains were developed for Goal 2 by linking strategies with a set of intermediate results (Appendix C, Figure C-2). Five strategies are identified to achieve this goal:

Strategy 2.1: Conduct education and outreach to ocean users on marine protection laws, including laws to prevent pollution from ships, ocean dumping laws and proper waste management at sea

Strategy 2.2: Provide low-cost and convenient disposal options for gear and solid waste

Strategy 2.3: Increase use of fishing materials and practices designed to reduce impacts of marine debris

Strategy 2.4: Strengthen marine protection laws, including ship pollution prevention and ocean dumping laws

Strategy 2.5: Build capacity to monitor and enforce against illegal discharge of solid waste at sea

Strategy 2.1: The legal framework governing pollution prevention from ships is in place at both international and national levels. Reinforcing existing rules and regulations through education and outreach will increase awareness of

the consequences of discharge from ships and best practices for gear and waste management for those at sea. Existing education and outreach activities conducted by the USCG should be continued. Education and outreach activities should be expanded to state and private harbors and ports and include information on the benefits of pollution prevention, use of biodegradable products, and impacts of marine debris on navigation and marine resources.

Strategy 2.2: The capacity for on-vessel storage and cost of disposal of unwanted fishing gear and solid waste is one of the primary deterrents to proper waste management. On-vessel management options should be explored and communicated to vessel operators. Low-cost and convenient disposal options for fishing gear and solid waste should be improved at all port and harbor facilities. State and private harbors and ports should provide low-cost disposal options to encourage proper waste management.

Strategy 2.3: Some fishing practices incorporate intentional loss of gear (e.g., slide-bait fishing). By modifying the practices or using less harmful, perhaps biodegradable, materials, this derelict gear can do less harm. Fishing materials and practices, both from shore and at sea, that minimize the impacts of marine debris need to be explored with gear producers and users. While this strategy will not necessarily decrease the amount of debris generated, it will render it less harmful.

Strategy 2.4: The disposal of plastic at sea is prohibited by international and national laws. However, the disposal of solid waste other than plastic generated from operations of vessels at sea is not currently prohibited in all areas by laws regulating pollution prevention from ships. Amendment of ship pollution prevention laws to prohibit disposal of solid waste from operations at sea is needed to reduce the incidence of discharges of solid waste from ships.

Strategy 2.5: Monitoring and enforcement of laws to prevent pollution from ships is needed to improve compliance. While enforcement at sea, particularly in international waters, is difficult, dock-side inspections and monitoring fishing gear and solid waste streams from vessels leaving and returning to state and private harbors and ports can help improve compliance.

With increased awareness of the laws, fines, and impacts of marine debris on navigational hazards and marine life, improved disposal options, and

monitoring and enforcement, ocean users will reduce the incidence of illegal discharge solid waste and fishing gear in the sea.

4.3 Goal 3 - Incidence of Abandoned and Derelict Vessels Decreased

Decreased incidence of abandoned and derelict vessels will reduce coral abrasion and breakage, disruption of ecosystems, and navigation hazards. Results chains were developed for Goal 3 by linking strategies with a set of intermediate results (Appendix C, Figure C-3). Three strategies are identified to achieve this goal:

Strategy 3.1: Educate vessel owners on maintenance and maritime preparedness

Strategy 3.2: Develop capacity and coordination mechanisms for abandoned vessel removal and disposal

Strategy 3.3: Develop sustainable funding mechanisms and resources for vessel removal and disposal

Strategy 3.1: Vessels are abandoned when damaged by storms, tsunamis or grounding events or when owners can no longer keep up with maintenance required to keep the vessel operational and in compliance with USCG safety inspections. Hawaii's boat owners and transiting vessels need to be prepared to maintain their vessels in operating condition and understand the steps that should be taken to prepare a vessel for severe storms. Education and outreach to vessel owners should include maintenance programs and storm-readiness/tsunami event training.

Strategy 3.2: Different agencies may be aware of or have distinct responsibilities regarding abandoned, grounded, or drifting vessels. Improved communication and coordination would result in faster response and removal, before vessels break apart or damage is done, and lower costs. Once removed, disposal of the vessel or vessel pieces can sometimes be a challenge; however increasing capacity and effectiveness of coordination will help in this.

Strategy 3.3: Sustainable funding mechanisms (a special fund, registration fees, insurance requirements) are needed to provide the capacity for agencies and vessel owners to remove and dispose of abandoned or non-operational vessels in a timely and cost-effective manner. Coordination among agencies is needed to provide the assets and resources to remove and properly dispose of these vessels. Enacting legislation to require insurance coverage for removal

of vessels that become non-operational would further decrease the incidence of abandonment. Low-cost disposal alternatives are needed for end-of-life vessels.

Increased awareness of vessel owners on maintenance and maritime preparedness coupled with improved communication and sustainable financing mechanisms will result in a decrease in the number of vessels abandoned due to weather, ocean conditions, groundings, or lack of maintenance.

4.4 Goal 4 - Land-based Debris in Waterways Reduced

Reduction in land-based debris in Hawaii's waterways, including rivers, streams, and the stormwater system, will reduce stress primarily on coastal and marine ecosystem and species as well as the economy. Results chains were developed for Goal 4 by linking strategies with a set of intermediate results (Appendix C, Figure C-4). Six strategies will contribute to achieving this goal:

Strategy 4.1: Conduct education and outreach targeted to specific audiences

Strategy 4.2: Improve effectiveness of stormwater permits

Strategy 4.3: Build capacity to enforce all appropriate laws to reduce discharge of solid waste

Strategy 4.4: Employ structural controls and BMPs to prevent land-based debris from entering the ocean

Strategy 4.5: Conduct cleanups in watersheds and beaches

Strategy 4.6: Decrease use of potential debris items

Strategy 4.1: Education and outreach is a cross-cutting strategy required to achieve the overall goal of reducing land-based debris in Hawaii's waterways. Education and outreach activities must be targeted to specific audiences and incorporate both social marketing and mobilization techniques. Target audiences include both the regulated community, to improve compliance with stormwater permit conditions, and the general public, to increase volunteer efforts for cleanup activities, decrease littering and dumping, and shift buying behavior away from non-reusable and non-biodegradable products.

Strategy 4.2: Permits are required for certain stormwater discharges. The effectiveness of addressing solid waste discharges through the stormwater permits can be improved by incorporating provisions that address solid

waste. Emphasizing solid waste source reduction with both the regulated and unregulated community will begin to reduce the amount of land-based debris conveyed to Hawaii's waterways.

Strategy 4.3: Although not required under the Clean Water Act, enforcement of litter/illegal dumping laws are important, if not critical, source reduction best management practices to prevent solid waste from entering the storm sewer system. Efforts to reduce trash discharges to waterways may place much needed emphasis on litter/illegal dumping laws as a more cost-effective means to prevent trash from entering the storm sewer system in the first place. The capacity to enforce littering/illegal dumping as well as stormwater permit requirements must be strengthened to prevent land-based debris from entering Hawaii's waterways.

Strategy 4.4: Structural controls and best management practices must be employed to prevent land-based debris from entering the ocean. Structural controls, such as trash collectors in stormwater drains and waterways, collect floatable material, thus preventing marine debris. Resources and funding are required to maintain these controls, including providing the necessary equipment and personnel to maintain structural controls and BMPs. Increased emphasis on the use of best management practices is needed to prevent land-based debris from entering waterways. Additionally, providing sufficient trash receptacles and timely disposal services in high-use areas is critical.

Strategy 4.5: Many community organizations conduct regular cleanups in watersheds and on beaches. Their efforts should be supported and recognized as one of the most important activities to reduce land-based debris in Hawaii's waterways. Many individuals have taken it upon themselves to clean up trash on our beaches as a daily regimen. This has substantial benefits to protected species and coral reefs. Resources and tools to support coordination and increased participation in voluntary cleanup efforts are needed to expand current activities to all watersheds and beaches. Statewide watershed cleanups can be strategically scheduled at the end of summer prior to rainy weather conditions. Additionally, government agencies are involved in response and removal of marine debris. Typically these agencies are engaged for significant marine debris items (e.g., large or hazardous). Increased coordination amongst agencies for marine debris response and removal, particularly in relation to marine debris that may pose imminent danger to humans or the environment, is needed. Additionally, increased response

coordination for large-scale marine debris events (e.g., Japan tsunami marine debris) is needed.

Strategy 4.6: The Hawaiian Islands have limited disposal options for solid waste. Non-biodegradable items are disposed of in landfills, incinerated at the H-Power facility, or end up as trash in watersheds and on beaches, and eventually as marine debris. Ultimately, we need to decrease our use of disposable items and reduce the importation and use of non-biodegradable items. Consumers and suppliers of non-reusable and non-biodegradable items should be the target of education and outreach activities on the benefits of reusable and biodegradable products as well as the impacts of marine debris. A multi-pronged approach is needed to reduce land-based debris in Hawaii’s waterways, including passing legislation to minimize the continued use and production of single-use plastics, such as plastic bottles and Styrofoam food containers.

5.0 PLAN IMPLEMENTATION AND MONITORING

The implementation and monitoring of outcomes of the HI-MDAP will be achieved through ongoing collaborative efforts and new partnerships needed to address specific strategies. The NOAA MDP has committed to support the adaptive management process from conceptualization and action plan preparation through implementation and monitoring (Figure 8). The HI-MDAP presents a conceptual model of the threats posed by marine debris (Figure 5 and 6). Threat reduction goals, intermediate results, and strategies were developed based on the conceptual model (Appendix C). This section presents activities to implement the plan and monitor progress.

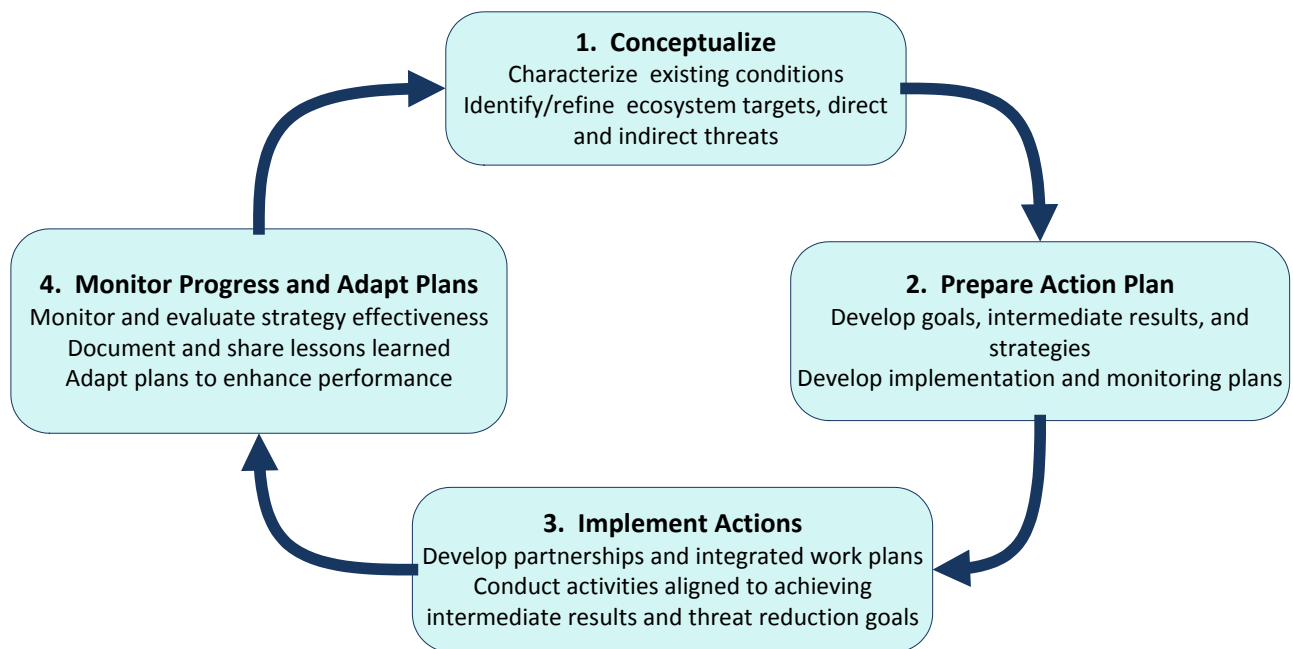


Figure 8. Adaptive Management Cycle

Participation in the HI-MDAP

In order for organizations or agencies to participate in the HI-MDAP, four items must be accomplished:

1. Adopt and agree to the appropriate results chain, finding a fit under a strategy;
2. Develop a site-specific results chain for your particular project (listing the resources that you bring to the table);
3. Adopt the metrics and agree to base metrics/indicators on what is in the results chain; and
4. Share your results using the results chain format.

6.0 TWO-YEAR MANAGEMENT CYCLE

As part of the adaptive management process, the HI-MDAP will be reviewed and updated every two years. This means that the HI-MDAP partners will meet to develop an implementation status report for the previous two years and an activity plan for the upcoming two-year period. In addition, the HI-MDAP goals and strategies will be updated accordingly during this time.

The implementation status report for the first cycle and the activity plan for the 2012–2013 are provided in the sections below. The accomplishments and activities were identified in the context of the results chains (Appendix C). Table 2 provides the number of accomplishments and planned activities tallied by strategy.

Table 2. HI-MDAP Accomplishments and Planned Activities

Strategy	Accomplishments Jan 2010 – Dec 2011	Planned Activities Jan 2012 – Dec 2013
Goal 1: Backlog of Marine Debris at Sea Reduced		
Strategy 1.1: Develop effective methods to locate marine debris accumulations	26	8
Strategy 1.2: Develop effective systems for reporting marine debris accumulations	26	9
Strategy 1.3: Develop capacity and coordination mechanisms for marine debris removal	20	10
Goal 2: Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased		
Strategy 2.1: Conduct education and outreach to ocean users on marine protection laws, including laws to prevent pollution from ships, ocean dumping laws and proper waste management at sea	13	18

Strategy	Accomplishments Jan 2010 – Dec 2011	Planned Activities Jan 2012 – Dec 2013
Strategy 2.2: Provide low-cost and convenient disposal options for gear and solid waste	6	3
Strategy 2.3: Increase use of fishing materials and practices designed to reduce impacts of marine debris	1	0
Strategy 2.4: Strengthen marine protection laws, including ship pollution prevention and ocean dumping laws	1	0
Strategy 2.5: Build capacity to monitor and enforce against illegal discharge of solid waste at sea	2	1
Goal 3: Number of Abandoned and Derelict Vessels Decreased		
Strategy 3.1: Educate vessel owners on maintenance and maritime preparedness	8	2
Strategy 3.2: Develop capacity and coordination mechanisms for abandoned vessel removal and disposal	3	2
Strategy 3.3: Develop sustainable funding mechanism and resources for vessel removal and disposal	2	0
Goal 4: Land-based Debris in Waterways Reduced		
Strategy 4.1: Conduct education and outreach targeted to specific audiences	45	15
Strategy 4.2: Improve effectiveness of stormwater permits	2	2

Strategy	Accomplishments Jan 2010 – Dec 2011	Planned Activities Jan 2012 – Dec 2013
Strategy 4.3: Build capacity to enforce all appropriate laws to reduce discharge of solid waste	4	1
Strategy 4.4: Employ structural controls and BMPs to prevent land-based debris from entering the ocean	2	2
Strategy 4.5: Increase coordination and targeted cleanups in watersheds and beaches	9	9
Strategy 4.6: Decrease use of potential debris items	10	12

6.1 Implementation Status Report (January 2010 – December 2011)

The accomplishments for the 2010-2011 implementation period are provided in Appendix D. The accomplishments were provided by the agencies and organizations listed in the table next to each activity. A summary of the implementation status by goal is provided below.

- **Goal 1 – Backlog of Marine Debris Reduced**

In the last two years, a significant amount of work was undertaken by marine debris partners across the State for this goal. Several marine debris accumulation zones were identified along island coastlines throughout the Main Hawaiian Islands (MHI). In addition, a large amount of research was conducted and published for the at-sea detection of marine debris. These activities further the progress of locating marine debris accumulations (Strategy 1.1).

To report found marine debris, two NGOs organized a marine debris reporting hotline for their local area and conducted outreach to the general public on how to report it. A portion of Hawaii’s marine debris community has started to utilize a standardized shoreline monitoring protocols provided by NOAA MDP (Strategy 1.2). Finally, tons of debris was removed throughout the island

chain through small and large-scale beach cleanups by volunteer groups and in the NWHI by NOAA (Strategy 1.3).

- ***Goal 2 – Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased***

Many agencies and organizations continued education and outreach programs targeting ocean users on pollution prevention from ships and proper waste management (Strategy 2.1). The Pier 38 port reception and Hawai‘i Nets to Energy programs continue to be a frequently used, low-cost, and convenient disposal option for gear and solid waste (Strategy 2.2). Strategies 2.3 to 2.5 under this goal did not have a great number of accomplishments and this may be an area of improvement for the next two-year period.

- ***Goal 3 – Number of Abandoned and Derelict Vessels Decreased***

One key accomplishment under this goal was proposed legislation to require mandatory boater education classes (Strategy 3.1). By having stricter education requirements for vessel owners this may lead to fewer boat accidents and thereby fewer abandoned and derelict vessels due to wreckage. A second accomplishment included a national workshop on abandoned vessel removal and disposal, and developing a response plan for derelict vessels adrift and aground in the NWHI. Finally, as a result of the April 2012 HI-MDAP Workshop, Strategy 3.2 and 3.3 were modified to also cover activities to develop mechanisms for disposal as well as removal of abandoned or derelict vessels.

- ***Goal 4 – Land-based Debris in Waterways Reduced***

As the number of accomplishments provided in Table 2 indicates, education and outreach programs for land-based debris continued to be a key focus area for all marine debris partners across the MHI (Strategy 4.1). The target audiences for these programs largely included young people ranging from school children to young adults. In addition, many organizations continue to utilize resources such as websites and public service announcements to inform the general public about prevention of land-based debris. Another significant accomplishment under this goal, implemented in 2011, is the inclusion of a trash reduction plan in the City and County of Honolulu’s NPDES municipal separate storm sewer system (MS4) stormwater permit. This

makes the permit more stringent and establishes a maximum daily allowance (Strategy 4.2). Since the permit is enforceable, this is an alternate and stronger method to establishing a total maximum daily load for trash in priority watersheds (former Strategy 4.3). Based on this accomplishment and lessons learned in California as well as information provided by EPA Region 9, as presented at the HI-MDAP Workshop in April 2012, former Strategy 4.3 was deleted from the HI-MDAP. See Appendix A for more information on this change.

Regular watershed and beach cleanups led, largely by volunteer non-governmental organizations, continued to be an area of high activity throughout the two-year period and resulted in the removal of tons of debris (Strategy 4.5). The passage of legislation to ban or reduce single-use plastic bags in Hawai‘i and Kauai County and the City and County of Honolulu was a landmark achievement in decreasing use of potential debris items (Strategy 4.6). In addition, thousands of public schools across the state are participating in a plastic-free schools program that aims to reduce or eliminate single-use plastics such as beverage bottles and food containers. Since no accomplishments or planned activities (see Section 6.2) were provided for former Strategy 4.8 and any potential activities for this strategy could also be applied under current Strategies 4.5 and 4.6, former Strategy 4.8 was deleted from the HI-MDAP. See Appendix A for more information on this change.

6.2 Activity Plan (January 2012 – December 2013)

Planned activities under each threat reduction goal and strategy to be implemented over the next two years (January 2012–December 2013) are provided in Appendix E. The activities were provided by the agencies and organizations listed in the table next to the activity. An overview of the planned activities by goal is provided below.

- ***Goal 1 – Backlog of Marine Debris at Sea Reduced***

The activities listed under this goal are largely a continuation and expansion of activities from the previous two-year period. Under Strategy 1.1 the NOAA MDP will continue to work with partners to implement standardized shoreline monitoring and data collection to build a baseline for various locations throughout the State. For example, several partners such as Hawai‘i Wildlife Fund, Surfrider Foundation, and Sustainable Coastlines Hawai‘i will use the form during routine net patrols and beach cleanups. At-sea detection

research will continue to include ocean modeling, developing capacity for at-sea detection by satellite, and development of unmanned aircraft systems (UAS) platforms. Finally, efforts will continue to opportunistically visually detect marine debris at sea, such as the TransPacific Marine Debris Survey.

Under Strategy 1.2, several non-government organizations are implementing a marine debris reporting hotline. On O‘ahu, several government agencies such as the Department of Land and Natural Resources, Division of Boating and Ocean Recreation are utilizing the O‘ahu Marine Debris Response Protocol and associated reporting form and the NOAA MDP has committed to continued education and outreach to partners for reporting marine debris. Under Strategy 1.3, in Hawai‘i County, several methods and partnership opportunities will be explored to expand the capacity for marine debris removal. In addition, the NOAA MDP will continue to provide financial and logistical support for marine debris removal in the NWHI.

- ***Goal 2 – Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased***

Under Strategy 2.1, as shown in Table 2, there has been a slight increase in the number of activities planned for this implementation period. Several partners will continue to conduct education and outreach on marine debris prevention. In addition, marine debris information will be integrated into existing programs and campaigns such as the Ocean Protection and Cultural Awareness (OPACA) program in Maui County (and in the future Kauai County), the “Post a Lookout” campaign led by DLNR DOBOR, and outreach materials provided by the Western Pacific Regional Fishery Management Council (WPFMC).

The planned activities under Strategy 2.2 are a continuation of activities from the previous period which include support for the Honolulu Harbor Port Reception Facility from WPFMC and the Hawai‘i Nets to Energy Program and Pier 38 port reception bin and program from the NOAA MDP. There are no activities planned under Strategy 2.3 and 2.4 and only one under Strategy 2.5, which is to continue to support legislation on reducing ocean dumping.

- ***Goal 3 – Number of Abandoned and Derelict Vessels Decreased***

Under Strategy 3.1, non-government organizations have committed to providing increased support for rulemaking requiring mandatory boater education for vessel owners. In addition, DLNR DOBOR will investigate mitigation for abandoned or derelict vessels with the National Association of State Boating Law Administrators (NASBLA). Under Strategy 3.2, DLNR DOBOR will research disposal options for privately owned vessels that have reached the end of their usable life. Increasing methods for inexpensive disposal could reduce the number of abandoned and derelict vessels in our nearshore waters. Finally interagency coordination for addressing abandoned vessels will be continued. There are no activities listed under Strategy 3.3.

- ***Goal 4 – Land-based Debris in Waterways Reduced***

The activities listed under Strategy 4.1 are largely a continuation and expansion of activities from the previous two-year period. For example, many non-government organizations will continue education and outreach at grade schools and colleges throughout the state and at community events such as beach cleanups. In addition, government agencies will integrate marine debris information into existing outreach programs. Under Strategy 4.2 the Hawai‘i Department of Health (DOH) and the EPA will continue to track the implementation of the new CCH NPDES MS4 stormwater permit trash reduction plan requirements. Under Strategies 4.3 and 4.3, the State of Hawai‘i, Coastal Zone Management (CZM) program will focus efforts on water quality and non-point pollution control systems while the Hilo Watershed boom study will be continued for Hilo Bay through the University of Hawai‘i at Hilo. Under Strategy 4.5, non-governmental organizations will continue to conduct regular watershed and beach cleanups. In addition, the State and Counties will investigate various methods to maintain clean city streams. Under Strategy 4.6, , building on the passage of the plastic bag ban or reduction legislation, organizations plan to work with large retailers, such as grocery stores, to educate consumers on reusable products. These organizations also plan to lead or support legislation for banning other potential debris items such as Styrofoam and cigarette butts.

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Appendix A – Changes to Original HI-MDAP (2010-2011)

Changes to HI-MDAP 2010 – 2012

Table A-1. Description of Changes to HI-MDAP 2010-2012

SECTION	CHANGE			DESCRIPTION
	ADD	DEL	MOD	
1.0	X			Added subsection 1.2 Plan History and renumbered other subsections accordingly.
1.0	X			Added subsection 1.3 Global Marine Debris Strategy and renumbered other subsections accordingly.
1.0	X			Added information on plastic marine debris to subsection 1.4.
1.0			X	Updated Figure 3 to incorporate recent data.
2.0	X			Added subsection 2.3 Updating the Plan.
2.0			X	Revised language for Goal 2.
2.0			X	Revised language for strategies 2.1, 2.4 and 2.5.
3.0	X			Added direct threat “Debris from natural disasters” with text explanation to subsection 3.2. Added direct threat “Debris from natural disasters” and associated indirect threat “Lack of contingency response plan for marine debris” and strategy “Marine debris incorporated into emergency response plans” to Figure 6.
4.0			X	Added “and disposal” to strategy 3.2 and 3.3.
4.0			X	Revised language for strategies 4.2 and 4.3.
4.0		X		Deleted strategies 4.3 and 4.8 and renumbered strategies accordingly (i.e., former Strategy 4.4 became 4.3, 4.5 became 4.4, etc.). Added summary table of all goals and strategies for 2012-2013. Added substantial additional information regarding government

				involvement in marine debris removal and mention of debris from natural disasters under Strategy 4.5.
5.0			X	Moved discussion of two-year activity plan to Section 6.0 and included table in the appendices (Appendix E). Replaced with content from Section 6.0 Plan Implementation and Monitoring. After replacement, updated content as appropriate.
6.0			X	Moved content up to Section 5.0. Replaced content with the implementation status report and overview of the two-year activity plan.
Appendices	X	X		Added: Appendix A – Changes to Original HI-MDAP 2010-2012; Appendix D – Accomplishments 2010-2012; Appendix E – Planned Activities 2012-2014; and Appendix F – Declaration of Support Signatories. Deleted: Appendix B – Past and Ongoing Actions to Address Threats from Marine Debris. Renumbered accordingly.
All			X	Made small text changes throughout document based on comments received from partners during the October 2012 review period of the draft HI-MDAP 2012-2014.

NOTES:

The section number refers to the section number from the original HI-MDAP 2010-2012.

Table A-2. HI-MDAP Contents List Comparison

Original HI-MDAP 2010 – 2012	Revised HI-MDAP 2012 – 2014
<p>1.0 Introduction</p> <p>1.1 Purpose of Plan</p> <p>1.2 Marine Debris in the Hawaiian Archipelago</p> <p>2.0 Plan Development</p> <p>2.1 Engaging Stakeholders</p> <p>2.2 Defining Threat Reduction Goals and Strategies</p> <p>3.0 Conceptual Model of Threats from Marine Debris</p> <p>3.1 Ecosystem Targets and Stressors</p> <p>3.2 Direct and Indirect Threats</p> <p>4.0 Threat Reduction Goals and Strategies to Reduce Impacts of Marine Debris</p> <p>4.1 Goal 1 – Backlog of Marine Debris Reduced</p> <p>4.2 Goal 2 – Introduction of Solid Waste and Fishing Gear at Sea and Coastal Areas Decreased</p> <p>4.3 Goal 3 – Number of Abandoned and Derelict Vessels Decreased</p> <p>4.4 Land-based Debris in Waterways Reduced</p> <p>5.0 Two-Year Activity Plan</p> <p>6.0 Plan Implementation and Monitoring</p> <p>7.0 References</p>	<p>1.0 Introduction</p> <p>1.1 Purpose of Plan</p> <p>1.2 Plan History</p> <p>1.3 Global Marine Debris Strategy</p> <p>1.4 Marine Debris in the Hawaiian Archipelago</p> <p>2.0 Plan Development</p> <p>2.1 Engaging Stakeholders</p> <p>2.2 Defining Threat Reduction Goals and Strategies</p> <p>2.3 Updating the Plan</p> <p>3.0 Conceptual Model of Threats from Marine Debris</p> <p>3.1 Ecosystem Targets and Stressors</p> <p>3.2 Direct and Indirect Threats</p> <p>4.0 Threat Reduction Goals and Strategies to Reduce Impacts of Marine Debris</p> <p>4.1 Goal 1 – Backlog of Marine Debris Reduced</p> <p>4.2 Goal 2 – Introduction of Solid Waste and Fishing Gear at Sea and Coastal Areas Decreased</p> <p>4.3 Goal 3 – Number of Abandoned and Derelict Vessels Decreased</p> <p>4.4 Land-based Debris in Waterways Reduced</p>

Original HI-MDAP 2010 – 2012		Revised HI-MDAP 2012 – 2014	
		5.0 Plan Implementation and Monitoring 6.0 Two-Year Management Cycle 6.1 Implementation Status Report 2010 – 2012 6.2 Activity Plan 2012 – 2014 7.0 References	
Appendix A	List of Agency/Organization Partners	Appendix A	Changes to Original HI-MDAP 2010-2012
Appendix B	Past and Ongoing Actions to Address Threats from Marine Debris	Appendix B	List of Agency/Organization Partners
Appendix C	Results Chains	Appendix C	Results Chains
Appendix D	Description of New Actions	Appendix D	Accomplishments 2010-2012
		Appendix E	Planned Activities 2012-2014
		Appendix F	Declaration of Support Signatories
NOTES:			
<ul style="list-style-type: none"> • <i>Bold and italicized text</i> indicates an addition from the previous version of the HI-MDAP 2010-2012. • Text was updated throughout revised version to make current. 			

Appendix B – List of Agency/Organization Partners

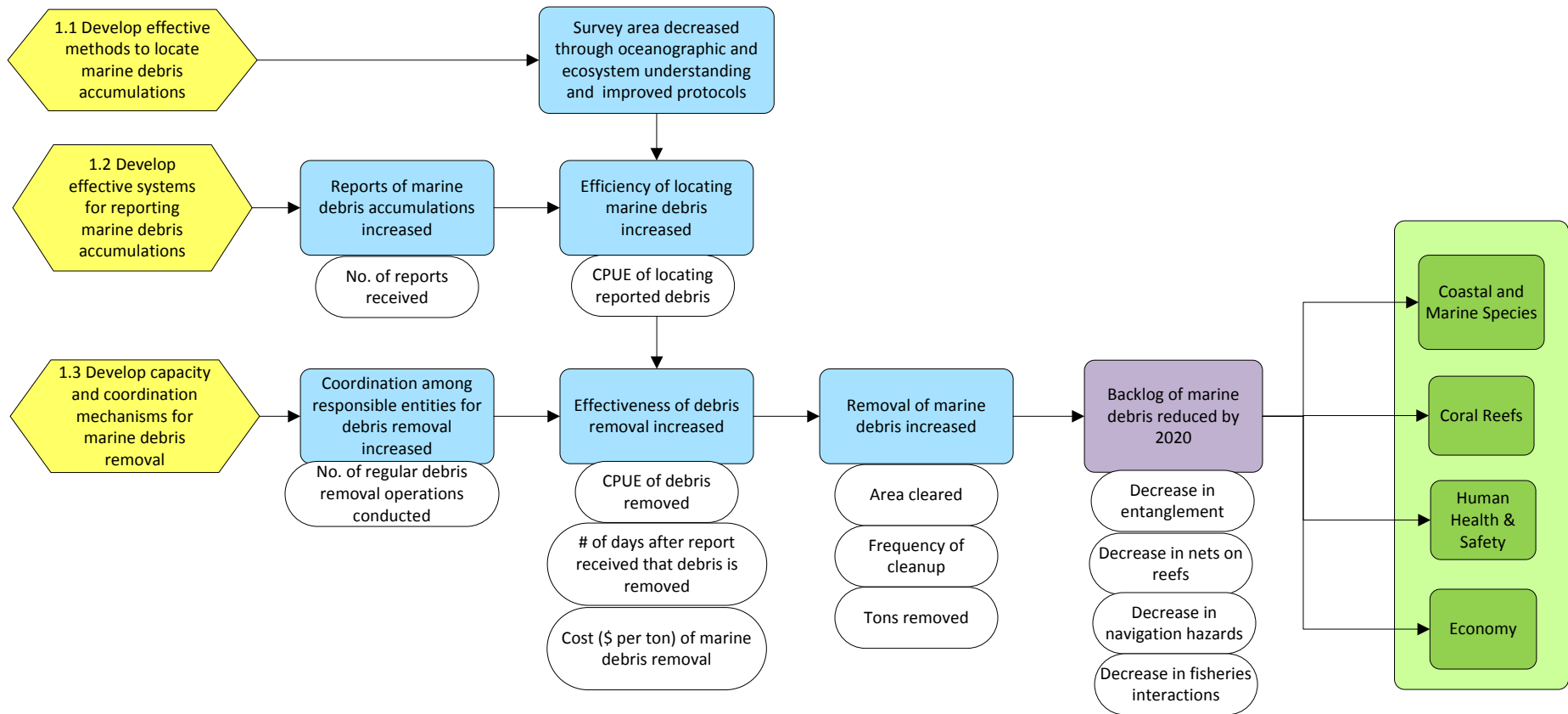
LIST OF AGENCY/ORGANIZATION PARTNERS IN THE HAWAI'I MARINE DEBRIS ACTION PLAN

1. Archinoetics
2. Chris Woolaway and Associates, LLC
3. City and County of Honolulu, Department of Emergency Management
4. City and County of Honolulu, Dept. of Environmental Services
5. City and County of Honolulu, Dept. of Parks and Recreation
6. City and County of Honolulu, Facility Maintenance
7. C-MORE, University of Hawaii
8. Community Work Day Program
9. Community Work Day Program
10. Coral Reef Alliance
11. County of Hawaii, Civil Defense
12. County of Hawaii, Parks and Recreation, Aquatics
13. County of Kauai, Civil Defense
14. County of Kauai, Department of Parks and Recreation
15. County of Maui, Mayor's office
16. Hawaii Institute of Marine Biology, University of Hawaii
17. Hawaii Ocean Observing System
18. Hawaii Wildlife Fund
19. Island Divers
20. Kokua Hawaii Foundation
21. Kupu
22. Malama Na Apapa
23. Marine Science, Hawaii Pacific University
24. Maui Reef Fund
25. Navy Region Hawaii
26. NOAA Fisheries Service, Restoration Center
27. NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary
28. NOAA Marine Debris Program
29. NOAA National Ocean Service, Office of Response and Restoration (NOS ORR)

30. NOAA Office of Law Enforcement
31. NOAA Office of Marine and Aviation Operations
32. NOAA Office of National Marine Sanctuaries, Pacific Islands Region
33. NOAA Pacific Islands Fisheries Science Center, Coral Reef Ecosystem Division
34. NOAA Pacific Islands Regional Office
35. NOAA Pacific Services Center
36. NOAA PIRO Observer Program
37. Oikonos - Ecosystem Knowledge
38. Pacific Islands Ocean Observing System (PacIOOS)
39. Pacific Ocean Producers (POP) Fishing and Marine
40. Papahānaumokuākea Marine National Monument
41. Reef Watch Waikiki
42. Schnitzer Steel Hawai'i Corporation
43. State of Hawaii, Coastal Zone Management Program
44. State of Hawaii, Department of Business, Economic Development, and Tourism
45. Surfrider Foundation, Hilo Chapter
46. Surfrider Foundation, Kauai Chapter
47. Surfrider Foundation, Oahu Chapter
48. Sustainable Coastlines Hawaii
49. Tetra Tech, Inc.
50. The Nature Conservancy
51. TransPacific Marine Debris Survey
52. U.S. Coast Guard
53. U.S. Environmental Protection Agency, Region 9
54. U.S. Fish and Wildlife Service
55. UH Hawaii Institute of Marine Biology
56. UH Hilo Marine Science
57. UH Marine Option Program
58. UH, School of Ocean and Earth Science Technology (SOEST)
59. University of Hawaii
60. University of Hawaii Marine Option Program
61. Western Pacific Regional Fisheries Management Council

Appendix C – Results Chains

Goal 1 – Backlog of marine debris reduced



NOTES:
 CPUE – catch per unit effort

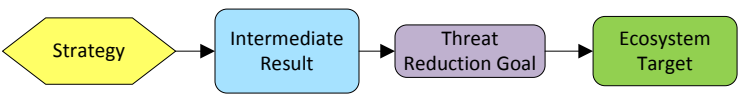


Figure C-1. Results chains for threat reduction Goal 1 – Backlog of marine debris reduced.

Goal 2 – Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased

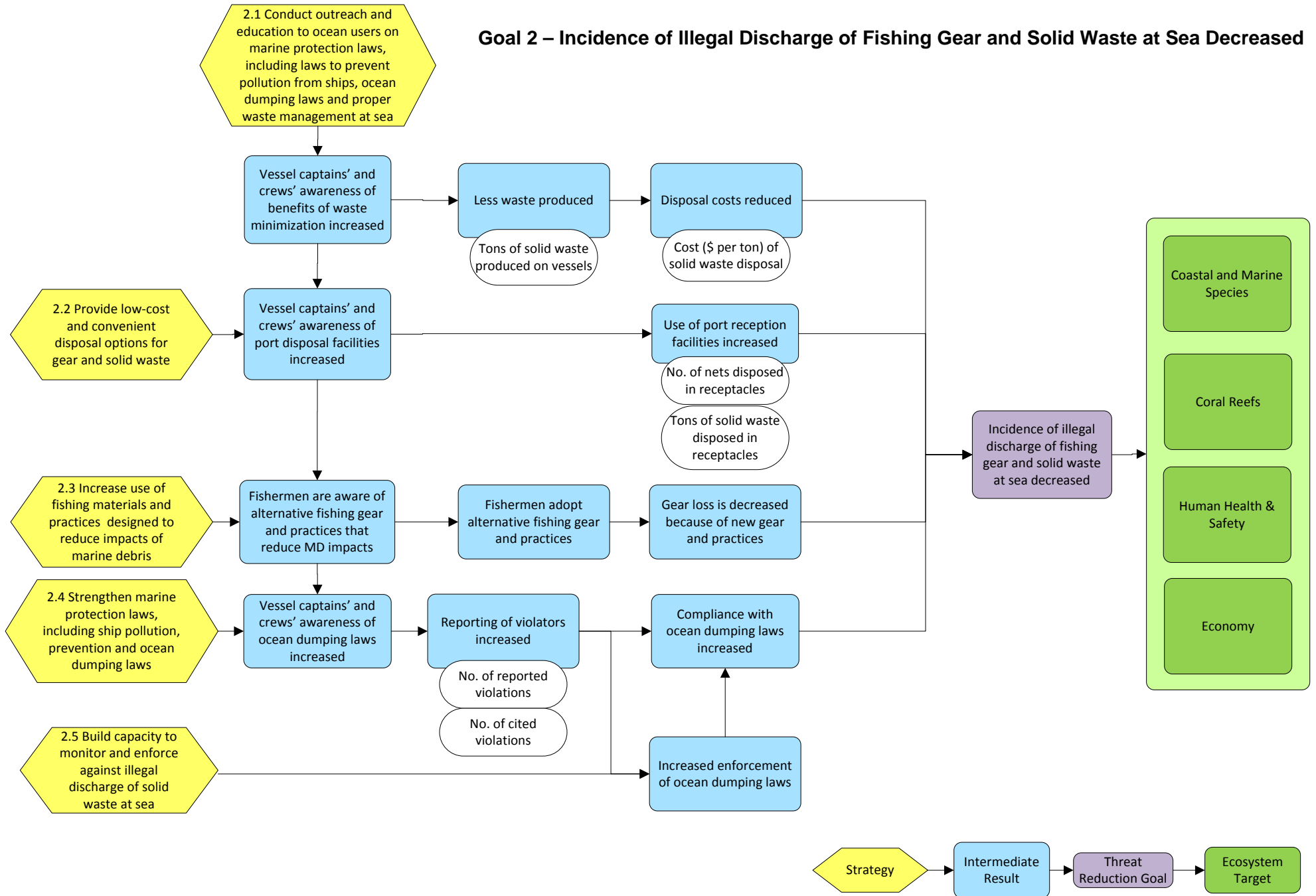


Figure C-2. Results chains for threat reduction Goal 2 –Incidence of Illegal Discharge of Fishing Gear and Solid Waste At Sea Decreased

Goal 3 – Number of Abandoned and Derelict Vessels Decreased

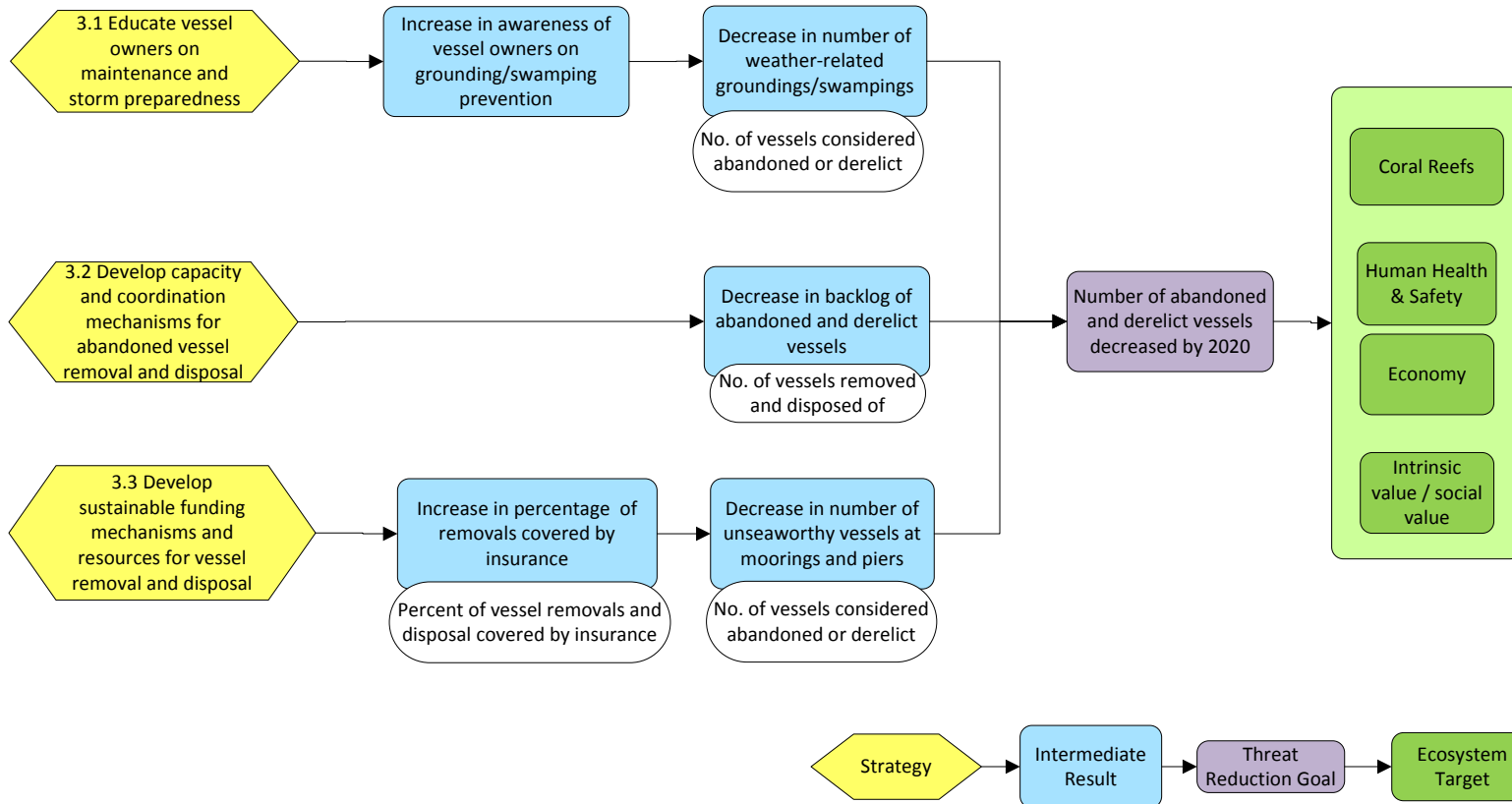


Figure C-3. Results chains for threat reduction Goal 3 – Number of abandoned and derelict vessels decreased.

Goal 4 – Land-based Debris in Waterways Reduced

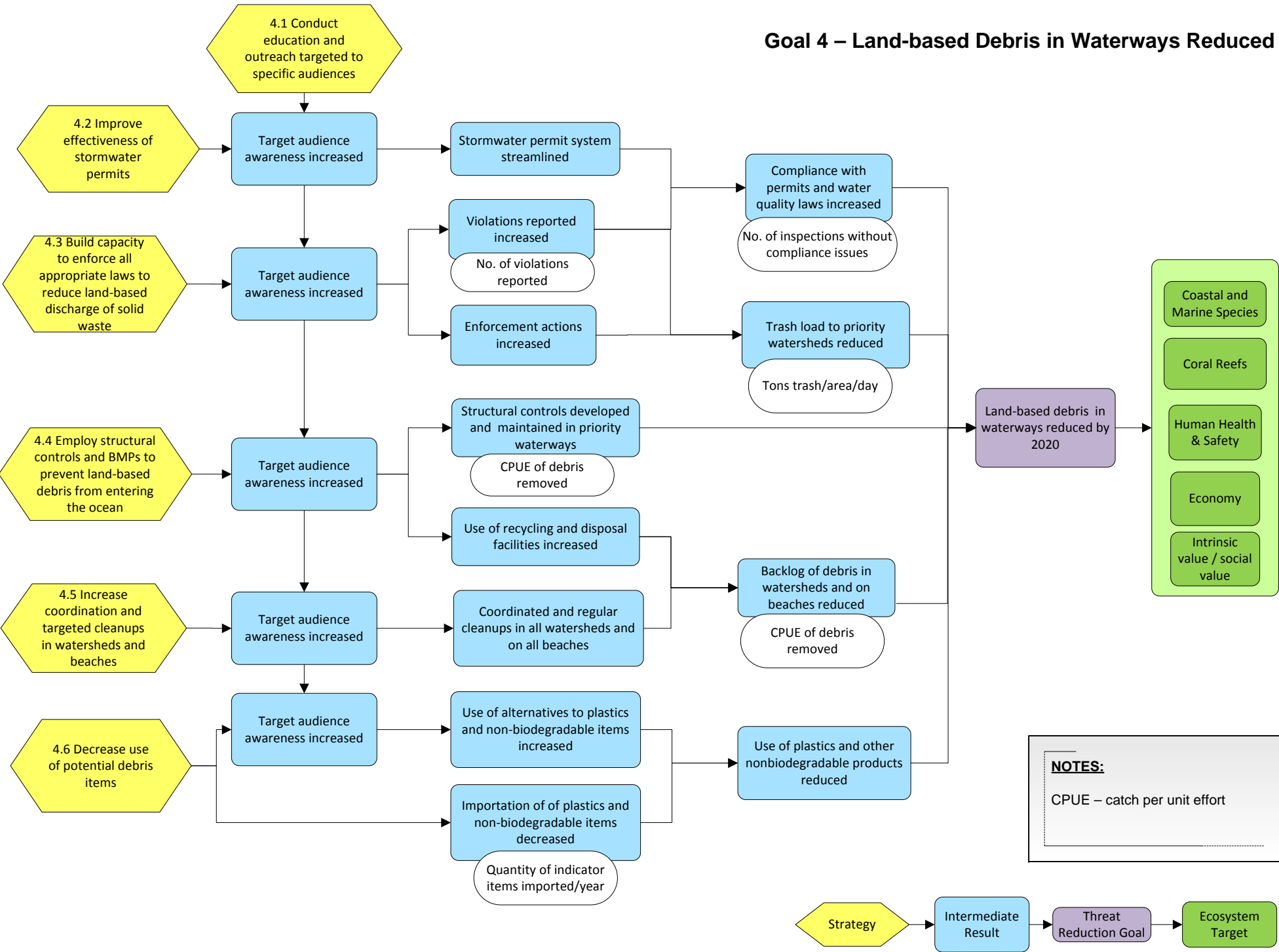


Figure C-4. Results chains for threat reduction Goal 4 – Land-based debris in waterways reduced.

Appendix D - Accomplishments 2010-2011

Accomplishments (2010-2011)	Organization/Point of Contact	Location
GOAL 1: Backlog of Marine Debris at Sea Reduced		
Strategy 1.1: Develop effective methods to locate marine debris accumulations		
FROM HI-MDAP (2010-2011)		
Implement at-sea detection strategy	NOAA; NASA and other partners as applicable	N. Pacific
ACCOMPLISHMENTS (2010-2011)		
Continued to monitor the Ka Lae - Wai'ohinu coastline monthly for net bundles and miscellaneous marine debris accumulations.	Hawaii Wildlife Fund, Megan Lamson	Hawaii
Utilized marine debris cellphone as a "hotline" for residents to report any other marine debris accumulation sites island wide.		
Conducted a back of boat survey from Hokulea training sail.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Conducted shoreline monitoring at North Beach for two years.		
Participated in the International Coastal Cleanup (ICC).	County of Kauai, Ocean Safety, Kalani Vierra	Kauai
Trained lifeguards to report found marine debris to county parks department.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Offered a reward of \$500 for the first piece of debris brought in that can be attributed to the Japanese Tsunami. Project is conducted in collaboration with a Kauai Community College student. Posters have been placed all around the island, urging fishermen, whale –watch boats, scuba boats to retrieve and bring in marine debris.		
Conducted 4 aerial surveys around Kaho'olawe to detect marine debris accumulations and any interactions with marine animals. Activity conducted as part of a NOAA MDP grant.	Kaho'olawe Island Reserve Commission	Maui
Provided technical assistance to develop the national strategy to detect JTMD at sea and along shorelines, including satellite, aerial, at-sea, and shoreline monitoring obs.	NOAA Marine Debris Program, Carey Morishige	National
Published an at-sea detection strategy as part of a special issue in the Marine Pollution Bulletin (Volume 65 • Issues 1–3 • 2012) called, "At-sea Detection of Derelict Fishing Gear."	NOAA Marine Debris Program, Carey Morishige	National
Produced high resolution satellite imagery (e.g., RADARSAT) acquisition and analysis to look for possible Japan tsunami marine debris in the North Pacific.		
Developed predictions for JTMD movement with the use of various models (NOAA OSCURS and GNOME).		
Prepared and submitted proposal to NOAA UAS program to test UAVs for marine debris detection at sea.		
Conducted at sea detection mission in April 2011 in partnership with USCG and NASA in the N. Pacific Subtropical Convergence Zone (STCZ).	NOAA Papahānaumokuākea Marine National Monument, Scott Godwin	Northwestern Hawaiian Islands
Prepared and submitted proposal to NOAA UAS program to test UAVs for marine debris detection at sea.	UH Hilo, Marine Science, Hank Carson, PhD	N. Pacific
Sailed across the North Pacific Gyre in July 2011 sampling small plastic fragments, larger items, and ghost nets. Currently processing samples to quantify the amount of debris, analyze its composition (type of plastic) and describe the community of fouling organisms.		

Accomplishments (2010-2011)	Organization/Point of Contact	Location	
Identified 925 unique pieces of floating debris (glass, plastic, or other) during passages made by volunteer TransPac and Pacific Cup sailors through the Great Pacific Garbage Patch to the Continental West Coast during 2010-2011.	TransPacific Marine Debris Survey, James Callahan	N. Pacific	
Presented at First World Seabird Conference: Titmus, A.J., Hyrenbach, K.D. 2010. Habitat associations of seabirds and marine debris in the North East Pacific at multiple spatial scales. 1st World Seabird Conference, Victoria, B.C., Canada.	Hawaii Pacific University, Karl David Hyrenbach, PhD	N. Pacific	
Published in the Marine Pollution Bulletin: Andrew J. Titmus, & K. David Hyrenbach. 2011. Habitat associations of floating debris and marine birds in the North East Pacific Ocean at coarse and meso spatial scales. Marine Pollution Bulletin, 62 (11): 2496-2506.			
Diagnosed real time surface currents in the SCUD model and made them public through the PacIOOS server. (and Jan Hafner)	University of Hawaii, Nikolai Maximenko, PhD	N. Pacific	
Coordinated expeditions of Kaisei/Ocean Voyages Institute to the subtropical North Pacific in search for microplastic and to test technology of its effective removal. (with Jan Hafner; KAISEI/Ocean Voyages Institute, Mary Crowley)		N. Pacific	
Communicated with numerous private cruisers and international sail training ships, who helped to confirm the existence of tsunami debris, floating in the ocean, in Summer-Fall 2011. (and sail training ships from Japan and Russia; private cruisers)		N. Pacific	
Prepared and submitted proposals to NSF RAPID and NASA DISASTER to monitor tsunami debris and help plan mitigation of its impact. (with Scripps Institution of Oceanography, Luca Centurioni; NASA JPL, Yi Chao; NOAA AOML, Rick Lumpkin)		N. Pacific	
Provided assistance to rescue experimental float of the NASA JPL, Summer 2011		Honolulu	
Obtained a grant from the US EPA to analyze marine debris in the content of ship engine filters		Honolulu	
Organized and fulfilled expedition to the southern coast of Big Island of Hawaii to study plastic, buried in the beach, and to measure trajectories of debris near the shore, Summer 2011. (with Oleg Melnichenko, Jan Hafner, Axel Lauer, Henry Carson)		Hawaii	
Responded on call from the Pacific Missile Range Facility in June 2011. Flew to Kauai to analyze unusual debris on their beach. Determined that it was, probably, washed by tsunami from one of Hawaiian islands. (with Jan Hafner; PMRF, John Burger)		Kauai	
Strategy 1.2: Develop effective systems for reporting marine debris accumulations			
FROM HI-MDAP (2010-2011)			
Review existing reporting mechanisms	NOAA; State of Hawaii, Dept. of Land and Natural	Statewide	
Enhance reporting mechanisms to improve ease and responsiveness	Resources; Counties; NGOs	Statewide	
ACCOMPLISHMENTS (2010-2011)			
Created a Ka'u-specific marine debris datasheet that has been used to record information about the content of the debris that is collected during community beach cleanup events. In the past month, HWF was sent the new NOAA marine debris datasheet. HWF plans to utilize this standardized form in the near future.	Hawaii Wildlife Fund, Megan Lamson	Hawaii	
Implemented use of the standardized reporting form provided by NOAA MDP.			
Implemented use of the standardized reporting form provided by NOAA MDP. Report to NOAA MDP the data from our monthly beach cleanups.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu	
Implemented use of the standardized reporting form provided by NOAA MDP.			
Compiled 16 months of data at different beaches but not many multiples of one.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu	

Accomplishments (2010-2011)	Organization/Point of Contact	Location
Convened agencies involved in Oahu marine debris response; developed point of contacts list (first and second tier responders), data sheets for agency use, and map tool for shoreline jurisdictions along the windward/east coast of Oahu. This project is referred to as the Oahu Marine Debris Response Project.	NOAA Marine Debris Program, Carey Morishige	Honolulu
Collaborated with 5 organizations to report significant sightings of marine debris in the North Pacific (disasterdebris@noaa.gov).		N. Pacific
Worked with 8 organizations and agencies to monitor marine debris along shorelines (most using the NOAA MDP Shoreline Monitoring Guide).		Statewide
Worked with James Callahan on the Marine Debris Visual Survey project with yacht sailors - Paperwork Reduction Act approved data collection sheet; analysis of data; and expansion of use to other "ships of opportunity"		N. Pacific
Continued to work with the NOAA Pacific Islands Regional Office Observer Program to collect data on marine debris encounters by Hawaii's longline fishermen.		N. Pacific
Worked with and funded the Univ. of Georgia to develop the "Marine Debris Tracker" app for iPhone, Droid, and Blackberry.		National
Identified marine debris accumulation points around the island of Kauai by reviewing survey current accumulation points.	County of Kauai, Civil Defense, Ted Daligdig III	Kauai
Monitored accumulation points through visual observation over a six month period (late 2011 to early 2012) to determine if there was an increase of debris at these points. No recognizable increase were noted.		
Developed a marine debris removal program, especially nets, for the island of Kauai. Informed the public to call or email if they see nets on the beaches. We then get a group of volunteers together to remove it asap.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Established a marine debris reporting hotline.	NOAA Marine Debris Program, Carey Morishige	National
Assisted with reporting mechanisms (disasterdebris@noaa.gov) for JTMD. Reaching out to all potential observers from sea, air, land. Also, satellite		
Developed an at sea detection marine debris data sheet in 2009 and used it in recruitment and training of Transpac and Pacific Cup sailors sailing from the Hawaiian Islands to the Continental West Coast. Since then, every July and August sailors have reported visual observations during daily 30 - 60 minute transects. Twenty one yachts reported back to the project with data during the 2010-present period.	TransPacific Marine Debris Survey, James Callahan	N. Pacific
Coordinated outreach for audiences from scientists to mariners through the use of mariner networks and W. Coast Harbor Safety Committees. Outreach provided on safety and effective reporting of interactions/observations with tsunami debris. The <i>STS Pallada</i> observations are a result of this collaborative effort. A mariner focused outreach pamphlet for ocean safety and documentation in collaboration with Harbor Pilots & University of Hawaii IPRC (Dr. Maximenko & Dr. Hafner) in final development. (with Hawaii Ocean Safety Team (H.O.S.T.) and University of Hawaii International Pacific Research Center, Dr. Maximenko & Dr. Hafner)	Chris Woolaway	National
Expanded ICC coastal cleanup site data collection throughout the year for State of Hawai'i. This Hawai'i state data base includes years 1988-2011 and will include all of 2012 and beyond. Hawai'i cleanup site data also includes earlier cleanup data and photos from Midway Atoll along data from the National Marine Debris Monitoring Program. (with The Ocean Conservancy, Get The Drift & Bag It!, Keep the Hawaiian Islands Beautiful, Keep Honolulu Beautiful and Friends of Honolulu Parks and Recreation)		Statewide

Accomplishments (2010-2011)	Organization/Point of Contact	Location	
Organized and hosted a workshop on tsunami debris, November 2011	University of Hawaii, Nikolai Maximenko	Honolulu	
Hosted a meeting with official delegation from Japan, February 2012		Statewide	
Provided numerous public lectures and interviews about general and tsunami marine debris. Also spoke at multi-agency meetings, provided free consultations and advice to agencies and companies, and briefed offices of federal senators. (with University of Hawaii, Jan Hafner and Gisela Speidel)		N. Pacific	
Developed public webpage at the University of Hawaii on problems of tsunami and general marine debris. (with University of Hawaii, Gisela Speidel)		National	
Organized and accomplished expedition northwest of Midway Atoll in December 2011. 11 satellite-tracked drifters and 400 markers were deployed, samples collected and structure of ocean currents studied. (with University of Hawaii Jan Hafner; Ocean Recovery Alliance, Doug Woodring; Scripps Institution of Oceanography, Luc Centurioni)		N. Pacific	
Participated in the NCEAS, GECAMP WG40, and NOAA SME teams on problems of marine debris			
Assisted with the establishment of partnership between the University of Hawaii and Sustainability Research Institute, Tottori University of Environmental Studies, Japan to address problems of tsunami debris and marine waste.			
Strategy 1.3: Develop capacity and coordination mechanisms for marine debris removal			
FROM HI-MDAP (2010-2011)			
Assess existing mandates and capacities for marine debris removal	NOAA; US Coast Guard; State of Hawaii, Dept. of Land	Statewide	
Prepare model guide on coordination for debris removal	and Natural Resources, Div. of Boating and Ocean	Statewide	
Conduct workshop with responsible agencies to review guide	Recreation; Counties; NGOs	Statewide	
ACCOMPLISHMENTS (2010-2011)			
Hosted 19 beach clean-ups to remove 67,114 lbs over 718 volunteer days on 75 miles of coastline.	Hawaii Wildlife Fund, Megan Lamson	Hawaii	
Conducted 19 beach cleanups with community and school groups, as well as other volunteers from around Hawai'i nei. During these beach cleanups and monthly net recovery runs, HWF and volunteers have removed over 67,114 lbs. of marine debris from along 75 miles of coastline. This breaks down to 33,514 lbs. of non-net debris, and 33,600 lbs. of derelict fishing net bundles.			
Hosted 9 large scale clean-ups working with multiple audiences, specifically the City and County of Honolulu to remove debris once collected.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu	
Removed XX lbs of debris along windward coast of Oahu with 700 volunteers.			
Organized with various non-profit organizations and local companies to educate conduct beach cleanup activities.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu	
Coordinated dive shops and dive groups to conduct underwater marine debris removal efforts.	Malama Na 'Apapa, Scott Bacon	Kauai	
Collected donated gear from dive shops to be used during marine debris removal efforts.			
Coordinated with 5 other NGO groups for net patrol and monthly marine debris removal.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai	
Cataloged debris, on NOAA format, to be able to monitor the arrival of JTD			
Lead school groups in marine debris beach clean-ups.			
Convened agencies involved in Oahu marine debris response; developed point of contacts list (first and second tier responders), data sheets for agency use, and map tool for shoreline jurisdictions along the windward/east coast of Oahu. This project is referred to as the Oahu Marine Debris Response Protocol/Project.	NOAA Marine Debris Program, Carey Morishige	Honolulu	
Continued to assist in coordination and funding of NOAA derelict fishing gear removal efforts in the Northwestern Hawaiian Islands.		Northwestern Hawaiian Islands	

Accomplishments (2010-2011)	Organization/Point of Contact	Location
Provided coordination assistance with Japan tsunami marine debris response agencies and organizations.		Statewide
Provided assistance and support of the creation of Main Hawaiian Islands and Northwestern Hawaiian Islands contingency response plans for Japan tsunami marine debris.		Statewide
Provided funding through grants for marine debris removal.		Statewide
Continued to assist in coordination and funding of NOAA derelict fishing gear removal efforts in the Northwestern Hawaiian Islands.	NOAA Papahānaumokuākea Marine National Monument, Scott Godwin	Northwestern Hawaiian Islands
Removed 260 lbs of fishing line and lead during underwater cleanups in 2012.	Hawaii Wildlife Fund/Maui Reef Fund, Hannah Bernard	Maui
Continued recovered debris and solid waste removal process for NWHI collection at Midway Atoll. Process of NWHI Project waste recycling in Honolulu developed with partnership of recycling industries' "Aloha Aina". Funded by NFWF and DOW with Friends of Midway Atoll. PACON 2010 project results presentation on project results.	Midway Marine Debris Coastal Monitoring, Chris Woolaway	Northwestern Hawaiian Islands
Assisted federal and state agencies in at sea detection of tsunami debris and preparing for its impact on Midway and US west coast.	University of Hawaii, Nikolai Maximenko and Jan Hafner	National/ Northwestern
Conducted a 14-day removal effort in April 2011 in the Northwestern Hawaiian Islands (NWHI), resulting in 15MT of derelict fishing gear removed. Building staff for another marine debris removal mission in the NWHI.	NOAA Coral Reef Ecosystem Division, Kelley Sage	Northwestern Hawaiian Islands

Accomplishments (2010-2011)	Organization/Point of Contact	Location
GOAL 2: Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased		
Strategy 2.1: Conduct education and outreach to ocean users on marine protection laws, laws to prevent pollution from ships, ocean dumping laws and proper waste management at sea¹		
FROM HI-MDAP (2010-2011)		
Define target audience for education and outreach activities	NOAA; NGOs; Western Pacific Regional Fisheries Management Council	N. Pacific
Develop education and outreach materials and activities by target audience		
Conduct education and outreach activities		
ACCOMPLISHMENTS (2010-2011)		
Hosted information booths at various community events in order to educate the public on marine debris issues.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Spoke at multiple schools and neighborhood boards specifically to promote clean up but also to let them know about issues of marine debris and single use plastics.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Organized Flotilla Event in July 4 in Waikiki.		
Placed ID on local fishing gear	County of Kauai	Kauai
Required Ocean Protection and Cultural Awareness (OPACA)	County of Maui, Rob Parsons	Maui
Conducted monthly underwater removal.	Snorkel Bob's (Maui)	Maui
Coordinated and co-hosted the 5th International Marine Debris Conference (www.5IMDC.org) - presentations, booths, workshops on marine debris, including proper waste mgmt. information.	NOAA Marine Debris Program, Carey Morishige	International
Participated in or presented at 58 outreach/education events in Hawaii on marine debris, including proper waste mgmt. information.		Statewide
Worked with fishing industry/community.		Statewide
Conducted Ocean Awareness Training (OAT).	NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, Paul Wong	Statewide
Distributed literature about waste management at harbors and its admin office counter.	State of HI, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Statewide
Distributed marine debris posters at numerous community and education events.	Western Pacific Regional Fishery Management Council (WPFMC), Sylvia Spalding/Eric Kingma	Statewide
Created Fishermen Code of Conduct signs and posters, which includes "Pick up your trash," and partnered with Hawaii Division of Boating and Ocean Recreation to have these placed in Heeia Kea and Kaunakakai harbors and at Moomomi. Also disseminated as the code as handouts at public events (e.g., Hawaii Ocean Expo) and placed as ads in publications (e.g., Lawaia).		
Strategy 2.2: Provide low-cost and convenient disposal options for gear and solid waste		
FROM HI-MDAP (2010-2011)		
Evaluate cost and incentives for use of existing disposal facilities	State of Hawaii, Dept. of Transportation; DLNR, Div. of Boating and Ocean Recreation; private harbors and ports	Statewide
Conduct feasibility study and economic analysis of disposal options		
ACCOMPLISHMENTS (2010-2011)		
Upgraded the Honolulu Harbor Port Reception Facility for Derelict Fishing Gear and Marine Debris. Built new enclosure on three sides of the bin	Western Pacific Regional Fishery Management Council (WPFMC), Sylvia Spalding/Eric Kingma	Honolulu
Worked with City and County of Honolulu, Method Products, Bokashi Bracelets. Did not conduct feasibility study or eco analysis.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu

Accomplishments (2010-2011)	Organization/Point of Contact	Location
Calculated that on average it costs us \$589* to remove one US ton (2,000 lbs) of marine debris from the Ka'u coastline. *This figure represents our work from 2003-2011 and includes both derelict fishing net bundles and community-based non-net debris removal efforts (i.e., beach cleanups) but does not include volunteer time.	Hawaii Wildlife Fund, Megan Lamson	Honolulu
Participated in the Nets to Energy program. Our nets and ropes that are stockpiled are shipped to HNL on an approximately yearly basis, to be chopped up by Schnitzer Steel and burned in H-power. We are currently coordinating with the County of Kauai to find a centrally located County facility at which to store the nets. We hope to engage the public to remove and deposit the nets by themselves.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Continued to be a partner in the Pier 38 port reception program.	NOAA Marine Debris Program, Carey Morishige	Statewide
Continued to be a partner in the Hawaii Nets to Energy program.		
Strategy 2.3: Increase use of fishing materials and practices designed to reduce impacts of marine debris		
FROM HI-MDAP (2010-2011)		
Identify fishing materials and practices causing greatest impacts	Western Pacific Regional Fisheries Management Council	N. Pacific
Work with suppliers to find alternative gear		
Work with fishermen to implement improved fishing practices		
ACCOMPLISHMENTS (2010-2011)		
Collected information on an individual basis.	NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, Paul Wong	Statewide
Strategy 2.4: Strengthen marine protection laws, including ship pollution prevention and ocean dumping laws		
FROM HI-MDAP (2010-2011)		
Advocate for amendment of ocean dumping laws	NOAA; State Department; NGOs; Western Pacific Regional Fisheries Management Council	National/ N. Pacific
Prepare technical briefs to support amendment		
ACCOMPLISHMENTS (2010-2011)		
Worked with NOAA International Programs Office (Fisheries) staff on NOAA's key messages regarding suggested changes to MARPOL Annex V.	NOAA Marine Debris Program, Carey Morishige	National
Strategy 2.5: Build capacity to monitor and enforce against illegal discharge of solid waste at sea		
FROM HI-MDAP (2010-2011)		
Conduct monitoring and enforcement capacity assessment	NOAA; USCG; State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation; private harbors and ports	Statewide
Conduct workshop with agencies and other stakeholders to discuss monitoring and enforcement needs		
Prepare a capacity building plan		
ACCOMPLISHMENTS (2010-2011)		
Caught illegal gill net placements	DLNR Division of Conservation and Resources Enforcement (DOCARE), Randy Awo	Statewide
Found and reported broken FADs	University of Hawaii, Hawaii Institute of Marine Biology, Warren Cortez	Statewide
NOTES		
¹ Dumping has a specific meaning under the Marine Protection, Research and Sanctuaries Act (MPRSA) (Ocean Dumping Act). It is more appropriate to use "discharge" in place of "ocean dumping". Strategies updated based on this recommendation provided by the U.S. EPA Region 9 during the October 2012 review period of the HI-MDAP.		

Accomplishments (2010-2011)	Organization/Point of Contact	Location
GOAL 3: Number of Abandoned and Derelict Vessels Decreased		
Strategy 3.1: Educate vessel owners on maintenance and maritime preparedness		
FROM HI-MDAP (2010-2011)		
Review existing information and guidelines on storm preparedness and grounding avoidance for vessels	NOAA; US Federal Emergency Management Agency	National/Statewide
Refine and update guidelines for storm preparedness and grounding avoidance		
Conduct training and outreach to vessel owners		
ACCOMPLISHMENTS (2010-2011)		
Documented 17 abandoned/derelict vessels on and around Slipper Island (Keehi Lagoon-Oahu) during the 2010,2011, 2012 ICC(International Coastal Cleanup) Site Coordinator for Slipper Island.	"Get The Drift & Bag It!" Hawaii's ICC, Matt Bickel, Architects Hawaii	Honolulu
Presented at the Marine Education Training Center in Hawaii County.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Provided boat donations.	State of HI, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Statewide
Proposed updating HAR 13.244-15.5 to require mandatory boater education classes.		
Continued to offer boating safety education classes, 500 students/year (WCC, USCG Aux.,US Power Squadron)		
Promoted Boat US – Online safety classes and preparedness		
Conducted statewide boating safety week (outreach including multiple partners).	NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, Paul Wong	Statewide
Participated in USCG Industry Day – Marine safety, search and rescue, etc.		
Strategy 3.2: Develop capacity and coordination mechanisms for abandoned vessel removal and disposal.¹		
FROM HI-MDAP (2010-2011)		
Refine communication protocols for abandoned, adrift, and grounded vessels	USCG; State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation; private harbors and ports	Statewide
ACCOMPLISHMENTS (2010-2011)		
Released the proceedings from the 2009 workshop on Abandoned and Derelict Vessels.	NOAA Marine Debris Program, Carey Morishige	National
Hosted a 2012 workshop on Abandoned and Derelict Vessels.		National
Worked with USCG and other Federal and state partners in HI to develop response plan for derelict vessels adrift and aground.	NOAA Office of Response and Restoration, Ruth Yender	N. Pacific
Strategy 3.3: Develop sustainable funding mechanism and resources for vessel removal and disposal.²		
FROM HI-MDAP (2010-2011)		
Conduct workshop to identify and recommend a range of sustainable financing mechanism and barriers to implementation	NOAA; State of Hawaii, Dept. of Transportation; DLNR, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation; private harbors and ports, insurance companies	Statewide
Conduct feasibility study on recommended range of sustainable financing mechanisms		Statewide
ACCOMPLISHMENTS (2010-2011)		
None listed	None listed	None listed
NOTES:		
^{1,2} Strategy modified at the April 2012 HI-MDAP Workshop. Added "and disposal" to end of strategy to cover activities to address disposal of abandoned vessels.		

Accomplishments (2010-2011)	Organization/Point of Contact	Location
GOAL 4: Land-based Debris in Waterways Reduced¹		
Strategy 4.1: Conduct education and outreach targeted to specific audiences		
FROM HI-MDAP (2010-2011)		
Define target audience for education and outreach activities	US EPA, Region 9; State of Hawaii, Dept. of Health; State of Hawaii, Coastal Zone Management Program	Statewide
Develop education and outreach materials and activities by target audience		
Conduct education and outreach activities		
ACCOMPLISHMENTS (2010-2011)		
Conducted education and outreach on throughout Hawai'i County. HWF has set up tables at multiple island-wide events from Earth Day, Ocean Day, Sustainability Fairs (in Hilo and Kona) over the past two years. In addition, we have made several presentations to college-level students at UH Hilo (75 students) and another to the entire 8th-grade level at Mililani Elementary School (100 students). Moreover, we have brought hundreds of residents from around Hawai'i nei, including various school and community groups, to some of the remote cleanup sites in SE Hawai'i to experience first-hand marine debris accumulation and removal efforts (718 participants).	Hawaii Wildlife Fund, Megan Lamson	Hawaii
Presented research as the 2011 International Marine Debris Conference.		
Continued to broaden outreach efforts at the Ala Wai Canal.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Honolulu
Continued to conduct outreach with the Hawaii Theater of Youth (in the past they have done production focusing on environmental issues, such as recycling).	State of Hawaii, Dept. of Health	Honolulu
Hosted an education and entertainment event at Fresh Café called "Ocean Dig" after Kewalo Clean-up.	Kokua Hawaii Foundation, Carol Feinga	Honolulu
Spoke at schools, fairs, outreach events, concerts, neighborhood board meetings.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Sea Dragon Ocean		
Supported Plastic Free Schools (currently 48, 21 on waiting list).		
Successful outreach (students and faculty) for proper sorting or recycled materials, now beginning to focus on reduction of single-use plastic products (bags, bottles).		
Aided schools in fund raising to implement this program.		
Incorporated local government agencies to support recycling on campuses.		
67,000 people on Kauai – Change tipping fees for shipping containers.		
Held water run-off demonstrations for outreach and education.	State of Hawaii, Dept. of Transportation	Honolulu
Conducted educational (interagency and campuses) water quality testing and marine debris cleanup events throughout the year.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Included SUP and Canoe clubs/organizations for clean-up efforts in the water and outreach.		
Supported bag ban bill.		
Showed the "Bag It" film to schools and community groups.		
Integrated marine debris as a training topic into Ocean Awareness Training workshops on Oahu in collaboration with the Hawaiian Islands Humpback Whale National Marine Sanctuary. Ocean Awareness Training was offered five times between 2010-Present in four communities (Hawaii Kai (x2), Waikiki, Kahuku, Kaneohe) for a total of 245 participants. www.oceanawarehawaii.org	UH Sea Grant College Program, Darren Okimoto	Honolulu
Presented on the topic of marine debris to university classes (~100 students), high school and elementary school classes (~100 students), and community groups (~50 people) in the Hilo area. Presented results of local experiments on land-based debris amount, sources and sinks from local area.	UH Hilo, Marine Science, Hank Carson, PhD	Hawaii
Presented at the ASLO conference in 2012 in Salt Lake City.		National/Statewide
Conducted education and outreach events (solid waste development) including fairs, and other organized events focusing on reducing trash going to landfills.	County of Kauai	Kauai

Accomplishments (2010-2011)	Organization/Point of Contact	Location
Supported the plastic bag ban	County of Kauai, Civil Defense, Mark Marshall	Kauai
Conducted free giveaways of compost bins to reduce the dumping of "white goods".		
Worked to get the plastic bag ban for Kauai County.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Started a "Styrofoam free Kauai" program.		
Worked with KCC to ban single use plastic water bottles.		
Sponsored a PSA on our most popular radio station.		
Worked with the school systems (environmental clubs, middle schools, etc.) for active involvement in the marine debris net patrol.		
Showed the film "Cycle of Insanity: The Real Story of Water".		
Forecasted broad impacts of Japan tsunami debris through research.	University of Hawaii, International Pacific Research Center, James Potemra, PhD	N. Pacific
Participated in or presented at 58 outreach/education events in Hawaii on marine debris, including proper waste mgmt. information.	NOAA Marine Debris Program, Carey Morishige	National/Statewide
Coordinated and co-hosted the 5th International Marine Debris Conference (www.5IMDC.org) - presentations, booths, workshops on marine debris, including proper waste mgmt. information.		
Created and updated several outreach products and materials on marine debris (available on www.MarineDebris.noaa.gov).		
Partnered with the Ocean Conservancy, Legacy Campaign, and others on large-scale educational programs to inform audiences about land-based marine debris.		
Developed and coordinated nationwide art contest on marine debris with school children (K-8).		
Partnered with local organizations and agencies on marine debris education and programs (e.g., Camp Erdman project with PMNM).		
Provided media messages to local and national communities.	State of Hawaii, Coastal Zone Management Program, Leo Asuncion	Statewide
Published the Hawaii Watershed Guidance Document in August 2010 through the CZM Program's Coastal Non-Point Control Program (CNPCP) The document is intended to help those involved in managing Hawaii's watersheds develop and implement watershed plans that have the greatest potential for achieving water quality goals. The document emphasizes selecting, implementing and monitoring appropriate management measures to reduce pollutant sources.		
Continued to conduct outreach on the document through informational training sessions with government agencies (state and county) as the primary audience.	NOAA Marine Debris Program, Carey Morishige	Statewide
Conducted outreach to range of HI audiences on JTMD.		
Developed website (www.kahoolawe.hawaii.gov/marinedebris.shtml) to showcase our marine debris cleanup activities and project videos.	State of Hawaii, Kaho'olawe Island Reserve Commission, Cheryl King	Statewide
Developed website (www.sharkastics.org) to highlight the issue of marine debris ingestion by marine animals and to recruit volunteers for KIRC and Hawai'i Wildlife Fund. The sharkastics collage was displayed at the Hawai'i Conservation Conference, the Maui Ocean Center, and is now on display in the KIRC office.		
Presented Kaho'olawe cleanup activity information at the International Marine Debris Conference and presented a poster at the Hawai'i Conservation Conference in 2011.		
Featured on OC16 "Outside Hawaii" episode on our Kanapou Cleanups: www.oc16tv./show/32.		
Shipped 6.6 tons of debris to Zurich, Switzerland for a museum display opening in July 2012, and then potentially touring Europe (www.museum-gestaltung.ch/en/).		
Strategy 4.2: Improve effectiveness of stormwater permits²		
FROM HI-MDAP (2010-2011)		
Conduct review of existing permitting system to identify gaps and barriers to debris prevention	US EPA, Region 9; State of Hawaii, Dept. of Health; State of Hawaii	Statewide
Develop measures to streamline process and incorporate best practices for debris prevention		

Accomplishments (2010-2011)	Organization/Point of Contact	Location
ACCOMPLISHMENTS (2010-2011)		
Provided promotion/support for Marine Debris to be included in permitting (maximum daily allowance).	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Worked with the DOH to include a trash reduction plan provision in the City and County of Honolulu's NPDES MS4 (municipal separate storm sewer system) stormwater permit issued in June 2011.	US EPA, Region 9, Hudson Slay	
Strategy 4.3: Establish Total Maximum Daily Loads for trash for priority watersheds³		
FROM HI-MDAP (2010-2011)		
Identify priority watershed for TMDL study for trash	US EPA, Region 9; State of Hawaii, Dept. of Health; State of Hawaii	Statewide
Conduct TMDL study for trash in priority watersheds		
Develop implementation plan with stakeholders		
Implement trash reduction and monitoring		
ACCOMPLISHMENTS (2010-2011)		
See notes below.		
Strategy 4.4: Build capacity to enforce all appropriate laws to reduce land-based discharge of solid waste⁴		
FROM HI-MDAP (2010-2012)		
Conduct enforcement capacity assessment	US EPA, Region 9; State of Hawaii, Dept. of Health; State of Hawaii	Statewide
Conduct enforcement workshop to identify opportunities to build capacity through partnerships		
ACCOMPLISHMENTS (2010-2011)		
Continued to address storm water issues with focus on rural, developing areas (Puna).	County of Hawaii, Civil Defense, Ben Fuata	Hawaii
Worked with DOH Clean Water Branch in order to obtain funding for water testing and help post warnings to the public of brown water advisories.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Enlisted the community to be the eyes/ears for water quality issues via a response hotline (311) which has been in effect at the county level for 4 months.	State of Hawaii, Dept. of Health	Honolulu
Continued to label storm drains		
Strategy 4.5: Employ structural controls and BMPs to prevent land-based debris from entering the ocean		
FROM HI-MDAP (2010-2011)		
Identify priority waterways for structural controls	US EPA, Region 9; State of Hawaii, Dept. of Health; State of Hawaii; Counties' Environmental Services; State of Hawaii. Dept. of Transportation	Statewide
Review effectiveness of existing best management practices to prevent land-based debris from entering the ocean		
ACCOMPLISHMENTS (2010-2011)		
Measured the amount of debris washed down two watersheds in Hilo, September 2011 - present, using floating retention booms.	UH Hilo, Marine Science, Hank Carson, PhD	Hawaii
Continued to calculate, analyze, and document (prior to removal) the amount and type of debris collected by the booms at the mouth of the Ala Wai.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Honolulu
Strategy 4.6: Increase coordination and targeted cleanups in watersheds and beaches		
FROM HI-MDAP (2010-2011)		
Establish a web-based clearinghouse to advertise and coordinate volunteer cleanup efforts	NGOs; Community groups	Statewide
Provide resources to volunteer groups for cleanup, reporting, and disposal		
ACCOMPLISHMENTS (2010-2011)		
Collaborated with numerous organizations and community groups about our current beach cleanup events and activities (NOAA MD Program, Natural Area Reserve/DLNR, Surfrider Foundation Hilo, Recycle Hawai'i, Keep Hawai'i Beautiful, County of Hawai'i). In addition, we try to promote other beach cleanup activities around the island with our email updates (to over 700 contacts).	Hawaii Wildlife Fund, Megan Lamson	Hawaii

Accomplishments (2010-2011)	Organization/Point of Contact	Location
Hosted monthly beach cleanups and advertise through various social media channels including but not limited to website, Facebook, twitter, etc.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Conducted watershed cleanups at various watersheds on Oahu.		Honolulu
Worked on a calendar for all organizations to be on the same page.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Continued to inspect city beaches after storm events for storm-generated debris.	City and County of Honolulu, Department of Facility Maintenance, Thomas Takeuchi	Honolulu
Lead volunteer clean-ups for nearly 5 years, with the coordination of 5 other Ngo. We now have sponsorship and volunteers from companies e.g. Starbucks, Kauai Coffee, Hyatt, Pointe at Poipu. Our website announce dates of cleanups and provides email address so people can tell of debris.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Organized and conducted 10 marine debris cleanups of Kanapou Bay's Keone'uli Beach, utilizing 110 different individuals (3,956 volunteer hours and 2,797 staff hours) for a total of 31 tons removed: 2.1 tons were recycled/reused, 6.6 tons were sent to a museum in Zurich, Switzerland for a display, 13 tons of nets were utilized for erosion control in Kaho'olawe's gullies, and 9.3 tons had to go to Maui's landfill. Funding for this work came from a 2010-2011 NOAA grant.	State of Hawaii, Kaho'olawe Island Reserve Commission, Cheryl King	Maui
Provided resources (e.g., educational materials and giveaways) for organizations and school groups to supplement beach cleanup efforts.	NOAA Marine Debris Program, Carey Morishige	Statewide
Organized, produced and throughout the year outreached statewide ICC program Hawaii's "Get the Drift & Bag It!". Results for 2010 & 2011-5,924 volunteers; 190,591.43 pounds debris recovered of which approximately 90% was from land based sources. (with Get The Drift & Bag It! and Hawaii's International Coastal Cleanup)	Chris Woolaway	Statewide
Coordinate beach cleanup projects with various organizations throughout the year. Provide resources to the volunteer organizations for cleanup and disposal.	City and County of Honolulu, Department of Parks and Recreation, Clinton Jamile	Honolulu
Conduct beach cleanup at City and County of Honolulu parks after storm events for storm-generated debris.		
Strategy 4.7: Decrease use of potential debris items		
FROM HI-MDAP (2010-2011)		
Establish baseline of types and quantity of potential debris items imported	State of Hawaii, Dept of Health; Hawaii State Legislature; NGOs; private sector	Statewide
Conduct workshop with major buyers to raise awareness of the impacts of importing non-biodegradable items		
ACCOMPLISHMENTS (2010-2011)		
Used the results of debris-retention boom and drifter study to rally support for passage of a plastic bag reduction act in Hawaii County. Enacted a letter-writing campaign and brought students to speak at county council meetings. Bill was passed in December 2011 and signed into law January 2012.	UH Hilo, Marine Science, Hank Carson, PhD	Hawaii
Created the "10 things you can do to reduce the amount of marine debris" handout available in the website (www.wildhawaii.org).	Hawaii Wildlife Fund, Megan Lamson	Hawaii
Participated in legislation relating to the reduction of single use plastic bags.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Provided data and testimony to 2012 Hawaii State Legislature, City and County of Honolulu City Council, and served as a panelist on Hawaii PBS program "Insights" on land-based sources and littering behavior. (with Get the Drift and Bag It! and Keep the Hawaiian Islands Beautiful)	Chris Woolaway	Honolulu/Statewide
Provided support and leadership for the plastic bag ban.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Supported no water bottles on KCC campus and COSTCO.		
Provided awards to local health food store for no longer carrying plastic bottled water.		
Created and distributed "Styrofoam free Kauai" bumper stickers.		

Accomplishments (2010-2011)	Organization/Point of Contact	Location
Worked on a national level to standardize monitoring protocols and data collection. Working first with local organizations who do marine debris cleanups as a large component of their activities.	NOAA Marine Debris Program, Carey Morishige	National
Partnered with the Ocean Conservancy, Legacy Campaign, and others on large-scale educational programs to inform audiences about land-based marine debris.		
Published research paper on persistent organic pollutants (POPs) in plastic resin pellets from remote islands: Heskett, M., H. Takada, R. Yamashita, M. Yuyama, M. Ito, Y. B. Geok, Y. Ogata, C. Kwan, A. Heckhausen, H. Taylor, T. Powell, C. Morishige, D. Young, H. Patterson, B. Robertson, E. Bailey, and J. Mermoz. 2012. Toward establishment of background concentrations for International Pellet Watch. Marine Pollution Bulletin. 64:45-448.	Surfrider Foundation - Oahu Chapter, Marvin Heskett and NOAA Marine Debris Program, Carey Morishige	National
Strategy 4.8: Improve solid waste management⁵		
FROM HI-MDAP (2010-2011)		
None listed.	State of Hawaii, Dept of Health; Hawaii State Legislature; NGOs; private sector	None listed
ACCOMPLISHMENTS (2010-2011)		
None listed.	None listed	None listed
NOTES		
¹ As noted below, a couple of strategies have been deleted under this goal. Moving forward, the strategies have been renumbered in the HI-MDAP Activity Plan 2012-2013.		
² Strategy updated by the U.S.EPA in the October 2012 review period of Updated Draft of the HI-MDAP 2012-2013. Refer to Appendix A for the updated document for the basis of the change.		
³ Following the April 2012 HI-MDAP Workshop, this strategy has been deleted. Based on lessons learned by the State of California and the EPA Region 9, the new direction for addressing land-based trash discharge is directly through appropriate stormwater permits. A TMDL can be implemented through the stormwater permits.		
⁴ Strategy updated by the U.S.EPA in the October 2012 review period of Updated Draft of the HI-MDAP 2012-2013. Refer to Appendix A for the updated document for the basis of the change.		
⁵ Following the April 2012 HI-MDAP Workshop, this strategy has been deleted. This decision was based on: 1) no activities taking place under this strategy for the 2010-2011 period or planned for the 2012-2014 period, and 2) this strategy is covered by strategies 4.5 and 4.7.		

Appendix E – Planned Activities 2012-2013

Action Plan (2012-2013)	Organization/Point of Contact	Location
GOAL 1: Backlog of Marine Debris at Sea Reduced		
Strategy 1.1: Develop effective methods to locate marine debris accumulations		
FROM HI-MDAP (2010-2011)		
Implement at-sea detection strategy	NOAA; NASA and other partners as applicable	N. Pacific
PLANNED ACTIVITIES (2012-2013)		
Continue to conduct net patrol along southeast Hawaii Island coasts.	Hawaii Wildlife Fund, Megan Lamson	Hawaii
Continue GPS monitoring from ocean to landfill (including the full course trash takes).	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Conduct monthly shoreline monitoring with NOAA protocols.		
Appoint water safety officers		Kauai
Promote marine debris as part of ocean safety	County of Kauai, Parks and Recreation, Lenny Rapozo	Kauai
Use pictometry (1 m resolution imagery) to look for marine debris in all countries.	County of Kauai, Civil Defense, Mark Marshall	Kauai
Obtain coastal imagery for Niihau and Kauai.	County of Kauai, Civil Air Patrol	Kauai
Continue to improve and develop at-sea detection technology for marine debris.		
Capture, in a report, what was done during and for the Japan tsunami marine debris issue related to at-sea detection.	NOAA Marine Debris Program, Carey Morishige	National
Continue to use and evaluate satellite technology (RADARSAT and multi-spectral) for marine debris detection.		
Continue tow diver surveys and marine debris removal in the Northwestern Hawaiian Islands.	NOAA Coral Reef Ecosystem Division, Kelley Sage	Northwestern Hawaiian Islands
Continue monitoring efforts at Midway Atoll, Tern Island (French Frigate Shoals), and Kure Atoll in the Northwestern Hawaiian Islands.	Midway and Tern: US Fish and Wildlife Service, Lee Ann Woodward and Kure Atoll: State of Hawaii, Cynthia Vanderlip	Northwestern Hawaiian Islands
Provide assistance in marine debris source identification for monitoring efforts by DLNR-DOFAW in Northwestern Hawaiian Islands, Kure Atoll	NOAA Papahānaumokuākea Marine National Monument, Scott Godwin	Northwestern Hawaiian Islands
Partner with NOAA-UAS Program for continued development of UAS platforms for at sea detection		Northwestern Hawaiian Islands
Provide more observation data and improve ocean modeling.		
Provide data management support to show where marine debris is located and project the path of travel.	PacIOOS, Heather Kerkering	N. Pacific
Continue to work with yacht sailors on at-sea visual surveys for floating marine debris in the North Pacific (PRA-approved data collection form).	TransPacific Marine Debris Survey, James Callahan	N. Pacific
Continue to work with NOAA Office of Marine and Aviation Operations on reporting of marine debris at sea and work to expand to other Federal agencies. (N. Pacific)	NOAA Office of Marine and Aviation Operations	N. Pacific
Work with partners to assist with marine debris detection across the state of Hawaii.	NOAA Marine Debris Program and NOAA Papahānaumokuākea Marine National Monument	Statewide
Partner with NGOs, academia, and other organizations to implement standardized shoreline monitoring and data collection in order to build a baseline for various locations throughout the state. - Current partner(s): Sustainable Coastlines, Oahu - Potential partner(s): Surfrider Foundation – Kauai, Maui, Big Island, Oahu; Pacific Missile Range Facility (Navy; Kauai); Maui Community College MOP; Univ. of Hawaii at Hilo, Marine Science	NOAA Marine Debris Program, Sherry Lippiatt, PhD or Carey Morishige	Statewide
Strategy 1.2: Develop effective systems for reporting marine debris accumulations		
FROM HI-MDAP (2010-2011)		
Review existing reporting mechanisms	NOAA; State of Hawaii, Dept. of Land and Natural Resources; Counties; NGOs	Statewide
Enhance reporting mechanisms to improve ease and responsiveness		

Action Plan (2012-2013)	Organization/Point of Contact	Location
PLANNED ACTIVITIES (2012-2013)		
Implement a marine debris "hotline" for Hawaii County Work with partners to promote the new hotline.	Hawaii Wildlife Fund, Megan Lamson	Hawaii
Implement a marine debris reporting hotline for City and County of Honolulu.	Surfrider Foundation - Oahu Chapter, Marvin Heskett	Honolulu
Use the Oahu Marine Debris Response and Removal reporting form.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Honolulu
Add a reporting mechanism to Sustainable Coastlines website for public to identify areas with specific marine debris issues.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Continue Kauai Net Patrol	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD	Kauai
Promote marine debris reporting/tracking application, called "Marine Debris Tracker" - http://marinedebris.noaa.gov/projects/seamdi.html	PacIOOS, Heather Kerkering	National
Continue to model and forecast Japan tsunami marine debris (Pacific Ocean)	University of Hawaii, International Pacific Research Center, James Potemra, PhD	N. Pacific
Conduct education and outreach to partners for reporting marine debris to disasterdebris@noaa.gov , dlnr.marine.debris@hawaii.gov , and (808)587-0400.	NOAA Marine Debris Program, NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, City and County of Honolulu's Department of Emergency Management, State Dept. of Land and Natural Resources	Statewide
Strategy 1.3: Develop capacity and coordination mechanisms for marine debris removal		
FROM HI-MDAP (2010-2011)		
Assess existing mandates and capacities for marine debris removal	NOAA; US Coast Guard; State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation; Counties; NGOs	Statewide
Prepare model guide on coordination for debris removal		
Conduct workshop with responsible agencies to review guide		
PLANNED ACTIVITIES (2012-2013)		
Design/build net collection bins and place them at harbors on the Big Island.	Hawaii Wildlife Fund, Megan Lamson	Hawaii
Evaluate the effectiveness of those bins.		
Conduct meetings with Hawaii County Civil Defense and Department of Defense to investigate opportunities to build removal capacity for Hawaii County.		
Continue to conduct net patrol along southeast Hawaii Island coasts.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
Start a Japan tsunami debris response team (smaller items will be dealt with by volunteer groups).		
Develop website/page on which to post reporting forum and schedule clean-ups	NOAA Coral Reef Ecosystem Division, Kelley Sage	Northwestern Hawaiian Islands
Continue tow diver surveys and removal in the Northwestern Hawaiian Islands.		
Provide assistance and support of the creation of Northwestern Hawaiian Islands contingency response plans for Japan tsunami marine debris.	NOAA Marine Debris Program and NOAA Papahānaumokuākea Marine National Monument	Northwestern Hawaiian Islands
Provide financial and logistic support for MD removal in the Northwestern Hawaiian Islands.		Northwestern Hawaiian Islands
Provide coordination assistance with Japan tsunami marine debris response agencies and organizations.		Statewide
Removal of debris at Midway Atoll with Japan Tsunami Marine Debris (JTMD) funding.	NOAA Marine Debris Program, Carey Morishige	Northwestern Hawaiian Islands
Support planned response contingency planning workshops and efforts across West Coast, Hawaii and Alaska.		National

Action Plan (2012-2013)	Organization/Point of Contact	Location
GOAL 2: Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased		
Strategy 2.1: Conduct education and outreach to ocean users on marine protection laws, laws to prevent pollution from ships, ocean dumping laws and proper waste management at sea¹		
FROM HI-MDAP (2010-2011)		
Define target audience for education and outreach activities	NOAA, NGOs, Western Pacific Regional Fisheries Management Council	N. Pacific/Statewide
Develop education and outreach materials and activities by target audience		
Conduct education and outreach activities		
PLANNED ACTIVITIES (2012-2013)		
Research implementing Ocean Protection and Ocean Awareness (OPACA) program for Kauai.	County of Kauai	Kauai
Include marine debris information in the Ocean Protection and Cultural Awareness (OPACA) program.	County of Maui, Rob Parsons	Maui
Conduct MARPOL outreach in all oceans.	NOAA Office of Marine and Aviation Operations	National
Continue outreach to yacht sailors sailing from Oahu to West Coast.	TransPacific Marine Debris Survey, James Callahan	N. Pacific
Research the possibility of Public Service Announcements for targeting fisheries/boating due to Japan tsunami.	Sustainable Coastlines Hawaii, Kahi Pacarro	Statewide
Increase partnerships.		
Integrate waste management into existing outreach efforts and online reporting mechanisms.		
Conduct general education and outreach with local fishermen.		
Conduct education and outreach about MARPOL.	NOAA Marine Debris Program, Carey Morishige	Statewide
Refresh [communication] with cruise ship industry.	NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, Paul Wong	Statewide
Expand Ocean Awareness Training to other islands and partnerships		
Continue support for HAR 13-244-15.5 . If passed, it will include marine debris and abandoned derelict vessel education.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Statewide
Include marine debris information in the "Post a Lookout" outreach campaign.		
Research potential locations for marine debris storage at ports or harbors on Kauai and Maui		
Continue enforcement against illegal gill nets.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Conservation and Resource Enforcement	Statewide
Continue education and outreach to fisherman related to Derelict Fishing Gear, Marine Debris and Port Reception Facility. Print instruction brochure in Vietnamese, Korean and English.	Western Pacific Regional Fishery Management Council (WPFMC), Sylvia Spalding/Eric Kingma	Statewide
Expand distribution and posting of Fisherman Code of Conduct signs and posters at to more harbors throughout Hawaii		
Continue education and outreach about marine debris and community and education events.		
Continue work on Hawaii Administrative Rules (HAR) 13-244-15.5, the new mandatory education requirement for boaters. Educational information on marine debris and abandoned derelict vessels will be inserted in into State of Hawaii approved boating safety courses.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Statewide
Strategy 2.2: Provide low-cost and convenient disposal options for gear and solid waste		
FROM HI-MDAP (2010-2011)		
Evaluate cost and incentives for use of existing disposal facilities	State of Hawaii, Dept. of Transportation; DLNR, Div. of Boating and Ocean Recreation; private harbors and ports	Honolulu
Conduct feasibility study and economic analysis of disposal options		
PLANNED ACTIVITIES (2012-2013)		
Continue to support for the Honolulu Harbor Port Reception Facility for Derelict Fishing Gear and Marine Debris.	Western Pacific Regional Fishery Management Council (WPFMC), Sylvia Spalding/Eric Kingma	Honolulu
Continue to support and partner in the Hawaii Nets to Energy program.	NOAA Marine Debris Program, Carey Morishige	Statewide
Continue to support and partner in the Pier 38 port reception bin and program.		

Action Plan (2012-2013)	Organization/Point of Contact	Location
GOAL 2: Incidence of Illegal Discharge of Fishing Gear and Solid Waste at Sea Decreased		
Strategy 2.1: Conduct education and outreach to ocean users on marine protection laws, laws to prevent pollution from ships, ocean dumping laws and proper waste management at sea¹		
FROM HI-MDAP (2010-2011)		
Define target audience for education and outreach activities	NOAA, NGOs, Western Pacific Regional Fisheries Management Council	N. Pacific/Statewide
Develop education and outreach materials and activities by target audience		
Conduct education and outreach activities		
PLANNED ACTIVITIES (2012-2013)		
Research implementing Ocean Protection and Ocean Awareness (OPACA) program for Kauai.	County of Kauai	Kauai
Include marine debris information in the Ocean Protection and Cultural Awareness (OPACA) program.	County of Maui, Rob Parsons	Maui
Conduct MARPOL outreach in all oceans.	NOAA Office of Marine and Aviation Operations	National
Continue outreach to yacht sailors sailing from Oahu to West Coast.	TransPacific Marine Debris Survey, James Callahan	N. Pacific
Research the possibility of Public Service Announcements for targeting fisheries/boating due to Japan tsunami.	Sustainable Coastlines Hawaii, Kahi Pacarro	Statewide
Increase partnerships.		
Integrate waste management into existing outreach efforts and online reporting mechanisms.		
Conduct general education and outreach with local fishermen.		
Conduct education and outreach about MARPOL.	NOAA Marine Debris Program, Carey Morishige	Statewide
Refresh [communication] with cruise ship industry.	NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, Paul Wong	Statewide
Expand Ocean Awareness Training to other islands and partnerships		
Continue support for HAR 13-244-15.5 . If passed, it will include marine debris and abandoned derelict vessel education.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Statewide
Include marine debris information in the "Post a Lookout" outreach campaign.		
Research potential locations for marine debris storage at ports or harbors on Kauai and Maui		
Continue enforcement against illegal gill nets.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Conservation and Resource Enforcement	Statewide
Continue education and outreach to fisherman related to Derelict Fishing Gear, Marine Debris and Port Reception Facility. Print instruction brochure in Vietnamese, Korean and English.	Western Pacific Regional Fishery Management Council (WPFMC), Sylvia Spalding/Eric Kingma	Statewide
Expand distribution and posting of Fisherman Code of Conduct signs and posters at to more harbors throughout Hawaii		
Continue education and outreach about marine debris and community and education events.		
Continue work on Hawaii Administrative Rules (HAR) 13-244-15.5, the new mandatory education requirement for boaters. Educational information on marine debris and abandoned derelict vessels will be inserted in into State of Hawaii approved boating safety courses.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn	Statewide
Strategy 2.2: Provide low-cost and convenient disposal options for gear and solid waste		
FROM HI-MDAP (2010-2011)		
Evaluate cost and incentives for use of existing disposal facilities	State of Hawaii, Dept. of Transportation; DLNR, Div. of Boating and Ocean Recreation; private harbors and ports	Honolulu
Conduct feasibility study and economic analysis of disposal options		
PLANNED ACTIVITIES (2012-2013)		
Continue to support for the Honolulu Harbor Port Reception Facility for Derelict Fishing Gear and Marine Debris.	Western Pacific Regional Fishery Management Council (WPFMC), Sylvia Spalding/Eric Kingma	Honolulu
Continue to support and partner in the Hawaii Nets to Energy program.	NOAA Marine Debris Program, Carey Morishige	Statewide
Continue to support and partner in the Pier 38 port reception bin and program.		

Action Plan (2012-2013)	Organization/Point of Contact	Location
Strategy 2.3: Increase use of fishing materials and practices designed to reduce impacts of marine debris		
FROM HI-MDAP (2010-2011)		
Identify fishing materials and practices causing greatest impacts	Western Pacific Regional Fisheries Management Council	Statewide
Work with suppliers to find alternative gear		
Work with fishermen to implement improved fishing practices		
PLANNED ACTIVITIES (2012-2013)		
[None listed]	[None listed]	[None listed]
Strategy 2.4: Strengthen marine protection laws, including ship pollution prevention and ocean dumping laws²		
FROM HI-MDAP (2010-2011)		
Advocate for amendment of ocean dumping laws	NOAA, State Department, NGOs, Western Pacific	Statewide
Prepare technical briefs to support amendment	Regional Fisheries Management Council	
PLANNED ACTIVITIES (2012-2013)		
[None listed]	[None listed]	[None listed]
Strategy 2.5: Build capacity to monitor and enforce against illegal discharge of solid waste at sea³		
FROM HI-MDAP (2010-2011)		
Conduct monitoring and enforcement capacity assessment	NOAA; USCG; State of Hawaii, Dept. of Transportation;	Statewide
Conduct workshop with agencies and other stakeholders to discuss monitoring and enforcement needs	DLNR, Div. of Boating and Ocean Recreation; private	
Prepare a capacity building plan	harbors and ports	
PLANNED ACTIVITIES (2012-2013)		
Continue to support legislation on reducing ocean dumping.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
NOTES		
^{1, 2, 3} Dumping has a specific meaning under the Marine Protection, Research and Sanctuaries Act (MPRSA) (Ocean Dumping Act). It is more appropriate to use "discharge" in place of "ocean dumping". Strategies updated based on this recommendation provided by the U.S. EPA during the October 2012 review period of the HI-MDAP.		

Action Plan (2012-2013)	Organization/Point of Contact	Location
Strategy 2.3: Increase use of fishing materials and practices designed to reduce impacts of marine debris		
FROM HI-MDAP (2010-2011)		
Identify fishing materials and practices causing greatest impacts	Western Pacific Regional Fisheries Management Council	Statewide
Work with suppliers to find alternative gear		
Work with fishermen to implement improved fishing practices		
PLANNED ACTIVITIES (2012-2013)		
[None listed]	[None listed]	[None listed]
Strategy 2.4: Strengthen marine protection laws, including ship pollution prevention and ocean dumping laws²		
FROM HI-MDAP (2010-2011)		
Advocate for amendment of ocean dumping laws	NOAA, State Department, NGOs, Western Pacific	Statewide
Prepare technical briefs to support amendment	Regional Fisheries Management Council	
PLANNED ACTIVITIES (2012-2013)		
[None listed]	[None listed]	[None listed]
Strategy 2.5: Build capacity to monitor and enforce against illegal discharge of solid waste at sea³		
FROM HI-MDAP (2010-2011)		
Conduct monitoring and enforcement capacity assessment	NOAA; USCG; State of Hawaii, Dept. of Transportation;	Statewide
Conduct workshop with agencies and other stakeholders to discuss monitoring and enforcement needs	DLNR, Div. of Boating and Ocean Recreation; private	
Prepare a capacity building plan	harbors and ports	
PLANNED ACTIVITIES (2012-2013)		
Continue to support legislation on reducing ocean dumping.	Sustainable Coastlines Hawaii, Kahi Pacarro	Honolulu
NOTES		
^{1, 2, 3} Dumping has a specific meaning under the Marine Protection, Research and Sanctuaries Act (MPRSA) (Ocean Dumping Act). It is more appropriate to use "discharge" in place of "ocean dumping". Strategies updated based on this recommendation provided by the U.S. EPA during the October 2012 review period of the HI-MDAP.		

Action Plan (2012-2013)	Organization/Point of Contact	Location
GOAL 3: Number of Abandoned and Derelict Vessels Decreased		
Strategy 3.1: Educate vessel owners on maintenance and maritime preparedness		
FROM HI-MDAP (2010-2011)		
Review existing information and guidelines on storm preparedness and grounding avoidance for vessels	NOAA; US Federal Emergency Management Agency	National/Statewide
Refine and update guidelines for storm preparedness and grounding avoidance		
Conduct training and outreach to vessel owners		
PLANNED ACTIVITIES (2012-2013)		
Provide signature of support for DLNR DOBOR proposed legislation, HAR 13-244-15.5.	Surfrider Foundation, Oahu Chapter, Marvin Heskett Sustainable Coastlines Hawaii, Kahi Pacarro Hawaii Wildlife Fund, Megan Lamson	Statewide
Investigate mitigation for abandoned or derelict vessels with NASBLA	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation	Statewide
Strategy 3.2: Develop capacity and coordination mechanisms for abandoned vessel removal and disposal		
FROM HI-MDAP (2010-2011)		
Refine communication protocols for abandoned, adrift, and grounded vessels	USCG; State of Hawaii, DLNR, Div. of Boating and Ocean Recreation; private harbors and ports	Statewide
PLANNED ACTIVITIES (2012-2013)		
Investigate disposal options for abandoned vessels which may include county landfills or non-profit organizations. Publish findings on organization websites and other suitable outlets.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation	Statewide
Continue interagency coordination for addressing abandoned vessels.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation	Statewide
Strategy 3.3: Develop sustainable funding mechanism and resources for vessel removal and disposal		
FROM HI-MDAP (2010-2011)		
Conduct workshop to identify and recommend a range of sustainable financing mechanism and barriers to implementation	NOAA; State of Hawaii, Dept. of Transportation; DLNR, Div. of Boating and Ocean Recreation; private harbors and ports, insurance companies	Statewide
Conduct feasibility study on recommended range of sustainable financing mechanisms		
PLANNED ACTIVITIES (2012-2013)		
[None listed]	[None listed]	[None listed]

Action Plan (2012-2013)	Organization/Point of Contact
GOAL 4: Land-based Debris in Waterways Reduced	
Strategy 4.1: Conduct education and outreach targeted to specific audiences	
FROM HI-MDAP (2010-2011)	
Define target audience for education and outreach activities	US EPA, Region 9, Hudson Slay
Develop education and outreach materials and activities by target audience	State of Hawaii, Dept. of Health
Conduct education and outreach activities	State of Hawaii, Coastal Zone Management Program,
PLANNED ACTIVITIES (2012-2013)	
Continue education and outreach at schools and universities.	Hawaii Wildlife Fund, Megan Lamson
	Surfrider Foundation - Oahu Chapter, Marvin Heskett
Provide education and outreach on environmental services.	County of Kauai, Solid Waste Division
Continue education and outreach at schools and neighborhoods meetings focusing on marine debris and plastics.	Sustainable Coastlines Hawaii, Kahi Pacarro
Continue outreach events on single-use plastics, cigarette butts, and water bottles.	Surfrider Foundation - Oahu Chapter, Marvin Heskett
Continue school and community organization outreach efforts, public service announcements, and clean-ups.	Sustainable Coastlines Hawaii, Kahi Pacarro
Continue outreach events and partnerships.	
Hold Bishop Museum events (on Oahu, statewide focus)	University of Hawaii, International Pacific Research
Hold open house events at UH Manoa to showcase research (on Oahu, statewide focus)	Center, James Potemra, PhD
	Surfrider Foundation - Oahu Chapter, Marvin Heskett
Facilitate coordination of beach clean-up groups.	Sustainable Coastlines Hawaii, Kahi Pacarro
	Hawaii Wildlife Fund, Megan Lamson
	County of Maui, Rob Parsons
Engage in Algalita/5Gyres "Sea Dragon" event on Maui, July 1 st	County of Maui, Rob Parsons
Continue outreach to yacht clubs.	Trans-Pacific Marine Debris Survey, James Callahan
Continue education and outreach at schools.	NOAA Marine Debris Program, NOAA Hawaiian Islands
	Humpback Whale National Marine Sanctuary, NOAA
	Papahānaumokuākea Marine National Monument, and
	NOAA Coral Reef Ecosystem Division
Provide coastal zone management, measures, and mandates (some awaiting approval), statewide.	State of Hawaii, Dept. of Business, Economic
Provide education for DOH employees (Clean Water Act).	Development, and Tourism, Coastal Zone Management
Incorporate marine debris into Maui Visitor's Center lectures, etc.	NOAA Hawaiian Islands Humpback Whale National
	Marine Sanctuary, Paul Wong

Action Plan (2012-2013)	Organization/Point of Contact
Strategy 4.2: Improve effectiveness of stormwater permits	
FROM HI-MDAP (2010-2011)	
Conduct review of existing permitting system to identify gaps and barriers to debris prevention	US EPA, Region 9, Hudson Slay
Develop measures to streamline process and incorporate best practices for debris prevention	State of Hawaii, Dept. of Health
PLANNED ACTIVITIES (2012-2013)	
Continue to work on implementing e-permitting system for NPDES permits.	State of Hawaii, Dept. of Health
Track implementation of CCH NPDES MS4 stormwater permit trash reduction plan requirements.	US EPA, Region 9, Hudson Slay State of Hawaii, Dept. of Health
Strategy 4.3: Build capacity to enforce all appropriate laws to reduce land-based discharge of solid waste	
FROM HI-MDAP (2010-2011)	
Conduct enforcement capacity assessment	US EPA, Region 9, Hudson Slay
Conduct enforcement workshop to identify opportunities to build capacity through partnerships	State of Hawaii, Dept. of Health
PLANNED ACTIVITIES (2012-2013)	
Recommend the State Office of Planning follows proposed land-use conditions, pending review of the law.	State of Hawaii, Dept. of Business, Economic Development, and Tourism, Coastal Zone Management Program, Leo Asuncion
Strategy 4.4: Employ structural controls and BMPs to prevent land-based debris from entering the ocean	
FROM HI-MDAP (2010-2011)	
Identify priority waterways for structural controls	US EPA, Region 9, Hudson Slay
Review effectiveness of existing best management practices to prevent land-based debris from entering the ocean	Counties' Environmental Services State of Hawaii, Dept. of Health
PLANNED ACTIVITIES (2012-2013)	
Continue Hilo Watershed boom study.	UH Hilo, Marine Science, Hank Carson, PhD
Implement coastal non-point pollution control systems (agriculture, forestry, marinas, wetlands) appropriated correctly.	State of Hawaii, Dept. of Business, Economic Development, and Tourism, Coastal Zone Management Program, Leo Asuncion
Strategy 4.5: Increase coordination and targeted cleanups in watersheds and beaches	
FROM HI-MDAP (2010-2011)	
Establish a web-based clearinghouse to advertise and coordinate volunteer cleanup efforts	NGOs; Community groups
Provide resources to volunteer groups for cleanup, reporting, and disposal	
PLANNED ACTIVITIES (2012-2013)	
Continue efforts to clean streams and beaches.	Hawaii Wildlife Fund, Megan Lamson Surfrider Foundation - Oahu Chapter, Marvin Heskett
Develop a core general permit to increase the maintenance of city streams.	State of Hawaii, Dept. of Business, Economic Development, and Tourism, Coastal Zone Management Program, Leo Asuncion

Action Plan (2012-2013)	Organization/Point of Contact
Continue existing cleanup efforts and expand clean-ups to watersheds/canals.	Sustainable Coastlines Hawaii, Kahi Pacarro
Continue efforts to clean harbor areas - Ala Wai Small Boat Harbor: Sierra Club, Waikiki Yacht Club & NOAA (ICC site)	Numerous NGOs, agencies, community groups, etc.
Develop website/page on which to post reporting forum and schedule clean-ups	Sustainable Coastlines Hawaii, Kahi Pacarro
Continue engagement of OCCC workforce in cleanups	City and County of Honolulu
Continue clean-up activities surrounding the Ala Wai booms.	State of Hawaii, Dept. of Land and Natural Resources, Div. of Boating and Ocean Recreation, Clifford Inn
Continue to partner and improve coordination among varying groups/agencies.	Surfrider Foundation - Oahu Chapter, Marvin Heskett
	Sustainable Coastlines Hawaii, Kahi Pacarro
	County of Maui, Rob Parsons
Provide resources (e.g., educational materials and giveaways) for organizations and school groups to supplement beach cleanup efforts.	NOAA Marine Debris Program, Carey Morishige
Strategy 4.6: Decrease use of potential debris items	
FROM HI-MDAP (2010-2011)	
Establish baseline of types and quantity of potential debris items imported	State of Hawaii, Dept of Health; Hawaii State Legislature;
Conduct workshop with major buyers to raise awareness of the impacts of importing non-biodegradable items	NGOs; private sector
PLANNED ACTIVITIES (2012-2013)	
Support the cigarettes on beaches ban.	Surfrider Foundation - Oahu Chapter, Marvin Heskett
Work with grocery stores (Safeway, Times) to educate consumers on using reusable products.	Surfrider Foundation - Oahu Chapter, Marvin Heskett
Propose Styrofoam ban.	Surfrider Foundation - Oahu Chapter, Marvin Heskett
Research assistance with U.C. Davis Dr. Magnus Engwall on toxicity of persistent organic pollutants (POPs) in weathered marine debris - HDPE bottle caps.	Surfrider Foundation, Oahu Chapter, Marvin Heskett
Use sustainable/reusable bags during clean-ups.	Sustainable Coastlines Hawaii, Kahi Pacarro
Provide education and outreach on reduction of single-use plastic products.	Sustainable Coastlines Hawaii, Kahi Pacarro
	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD and Oahu Chapter, Marvin Heskett
	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD
Continue support for plastic bag ban.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD
Continue support for no water bottles on KCC campus. Trying to get COSTCO to do the same.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD
Continue to provide an award to local health food store for no longer carrying plastic bottled water.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD
Continue to distribute "Styrofoam free Kauai" bumper stickers.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD
Continue to support the Styrofoam ban.	Surfrider Foundation - Kauai Chapter, Carl Berg, PhD
Research the potential for a Waste to Energy facility on Maui.	County of Maui, Rob Parsons
Work on legislation (through education and outreach) targeting cigarette butts.	Sustainable Coastlines Hawaii, Kahi Pacarro
	Surfrider Foundation - Oahu Chapter, Marvin Heskett

Action Plan (2012-2013)	Organization/Point of Contact
	State of Hawaii, Dept. of Health

Appendix F – Declaration of Support Signatories

Declaration of Support *for the* **Hawai'i Marine Debris Action Plan**

Updated December 2012

As representatives of the marine debris community in Hawai'i, we recognize the importance of a clean ocean, free of marine debris, to the quality of the environment, natural resources, marine life, the economy, and safe navigation.

Our ongoing efforts to implement activities in the *Hawai'i Marine Debris Action Plan Update* preserve the vital environmental, economic, and social benefits to the citizens of the State and contribute to global efforts embodied in the *Honolulu Strategy: A Global Framework for the Prevention and Management of Marine Debris*.

We pledge our support to:

- ◆ The goals and work outlined in the *Hawai'i Marine Debris Action Plan, Updated December 2012*;
- ◆ The partners serving to carry out the *Hawai'i Marine Debris Action Plan*;
- ◆ The *Honolulu Strategy*; and
- ◆ Meet every two years to develop an implementation status report and two-year activity plan for the next two-year period.

It is with pride and commitment that we sign this agreement on the twenty-seventh day of April, in the year two thousand and twelve.

Declaration of Support *for the* Hawai'i Marine Debris Action Plan

Signatories

Carl Berg, PhD

Surfrider Foundation, Kaua'i Chapter

James Callahan

TransPacific Marine Debris Survey

Hank Carson, PhD

University of Hawai'i at Hilo, Marine Science

Carol Feinga

Kokua Hawai'i Foundation

Benedict Fuata

Emergency Management, County of Hawai'i

Melvin Kaku

Dept. of Emergency Management, City and
County of Honolulu

Lindsey Kesel

Sustainable Coastlines

Megan Lamson

Hawai'i Wildlife Fund

Jason Leonard

Papahānaumokuākea Marine National
Monument, NOAA

Carey Morishige

NOAA Marine Debris Program / IMSG

Kahi Pacarro

Sustainable Coastlines Hawai'i

Leonard Rapozo

County of Kaua'i

Louise Shinkoethe

Sustainable Coastlines Hawai'i

Thomas Takeuchi

Dept. of Facility Maintenance, City and County of
Honolulu

Nancy Wallace

NOAA Marine Debris Program

Ruth Yender

NOAA Emergency Response Division

Maria Carnevale

Papahānaumokuākea Marine National
Monument, Dept. of Land and Natural Resources

Hudson Slay

Region 9, U.S. Environmental Protection Agency

Kitty Simmonds

Western Pacific Regional Fishery Management
Council

Marvin Heskett

Surfrider Foundation, O'ahu Chapter

Clifford Inn

Division of Boating and Ocean Recreation, Dept.
of Land and Natural Resources

Scott Bacon

Mālama na 'Apapa

Carlie Wiener

COSEE (Centers for Ocean Sciences Education
Excellence)

Jennifer I. Barrett

Island Connect Consulting LLC



HAWAI‘I MARINE DEBRIS ACTION PLAN 2012-2013

**by
NOAA Marine Debris Program
with marine debris partners in the State of Hawai‘i**

Updated December 2012

**For copies of this document, please contact:
Carey Morishige
Pacific Islands regional coordinator
NOAA Marine Debris Program / IMSG
carey.morishige@noaa.gov**

1.0 INTRODUCTION

Marine debris is an ongoing problem worldwide. With increased use of synthetic materials like plastic, marine ecosystems have suffered from the impacts of marine debris. Tons of derelict fishing gear and trash may be found strewn along otherwise pristine Hawaiian beaches. Hawaiian monk seals, green sea turtles, and humpback whales become entangled in and injured from derelict fishing nets. These images highlight the need for increased marine debris efforts throughout the Hawaiian archipelago.

The Hawai'i Marine Debris Action Plan (HI-MDAP) was built on the significant ongoing and past efforts of Hawaii's marine debris community. The National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program (MDP) and the U.S. Environmental Protection Agency (EPA) facilitated the development of the HI-MDAP with active participation and input from Hawaii's marine debris community, from government agencies, nongovernmental organizations, academic institutions, and private entities.

"The problem of marine debris can be dealt with effectively only by ensuring a comprehensive approach that is local in scale and global in scope, directed at source prevention, and establishes an educated community that can be empowered to action." (NOAA, 2008)

1.1 Purpose of the Plan

The overall purpose of the HI-MDAP is to establish a comprehensive framework for strategic action to reduce the ecological, health and safety, and economic impacts of marine debris in Hawai'i by 2020. Due to the complexity of marine debris issues, there is a role for everyone in the implementation of this plan, including the private citizen who picks up litter from our beaches and watersheds; federal, state, and county government agencies that are mandated to address the threat of marine debris; private businesses and industry that get involved to serve the communities in which they operate; and nongovernmental and academic organizations that support a wide range activities like cleanup, research, education, and outreach. The HI-MDAP establishes threat reduction goals and strategies to promote coordinated action to address the significant threats posed by marine debris in the Hawaiian archipelago.

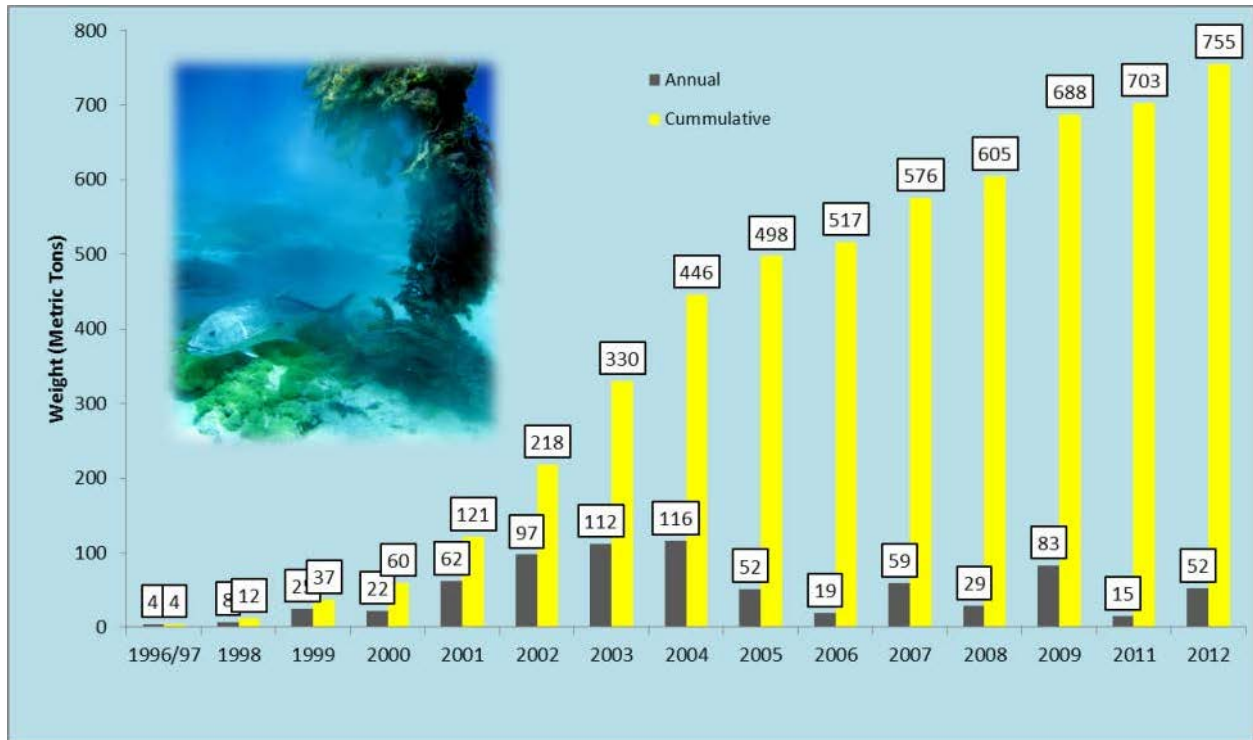


Figure 3. Quantity of derelict nets and other debris removed from the Northwestern Hawaiian Islands, 1997-2009 (NOAA PIFSC CRED, unpublished). Graph courtesy of NOAA PIFSC CRED.

In addition to these group efforts, numerous agencies and organizations across the state have been involved in addressing marine debris. From small beach cleanups to the multi-partner Hawai'i Nets to Energy Program, many activities and entities are addressing marine debris in Hawai'i. Despite extensive efforts over the past 10 years, marine debris continues to be a chronic threat to Hawaii's marine ecosystem as well as human health, navigation safety, and the economy. A more strategic approach is needed to maintain efforts to reduce the backlog of marine debris as well as increase efforts for debris prevention.

Hawai'i Marine Debris Action Plan



2012 Workshop

Declaration of Support for the Hawai'i Marine Debris Action Plan

Updated December 2012

As representatives of the marine debris community in Hawai'i, we recognize the importance of a clean ocean, free of marine debris, to the quality of the environment, natural resources, marine life, the economy, and safe navigation.

Our ongoing efforts to implement activities in the *Hawai'i Marine Debris Action Plan Update* preserve the vital environmental, economic, and social benefits to the citizens of the State and contribute to global efforts embodied in the *Honolulu Strategy: A Global Framework for the Prevention and Management of Marine Debris*.

We pledge our support to:

- ◆ The goals and work outlined in the *Hawai'i Marine Debris Action Plan, Updated December 2012*;
- ◆ The partners serving to carry out the *Hawai'i Marine Debris Action Plan*;
- ◆ The *Honolulu Strategy*; and
- ◆ Meet every two years to develop an implementation status report and two-year activity plan for the next two-year period.

It is with pride and commitment that we sign this agreement on the twenty-seventh day of April, in the year two thousand and twelve.

Hawai'i Marine Debris Action Plan



2012 Workshop

Signatories (as of 27 April 2012)

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