



2021 Hawai'i Marine Debris Action Plan

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Acknowledgements

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Several actions contained herein reference potential legislative changes. These actions will be carried out by interested partner organizations and are not affiliated with NOAA or the Marine Debris Program.

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Introduction

Marine debris is pervasive and especially difficult to address in Hawai'i. The dense population, relatively small land mass, and geographic isolation present infrastructure and cost challenges. Local litter and Pacific Ocean currents that carry marine debris to Hawai'i from afar have and continue to be major problems in the islands. However, there is a dedicated marine debris community in the islands that lead by example and persistence.

A long history of community-led environmental stewardship has laid the foundation for the Hawai'i Marine Debris Action Plan. Marine debris stakeholders from federal, state, private, academic, and nongovernmental sectors participate in the Hawai'i Marine Debris Action Plan around shared goals, strategies, and actions that they have created and work towards. Between 2010-2020, these partners came together to build and carry out the first Hawai'i Marine Debris Action Plan, and are now building upon this legacy through this next 10-year Action Plan.

In March 2021, the Hawai'i Marine Debris Action Plan community came together to celebrate the completion of the [2010–2020 Action Plan](#) and kick off planning efforts. Congressman Ed Case, Congressman Kaiali'i Kahele, and Senator Brian Schatz joined the virtual workshop to provide congratulatory remarks and acknowledge the accomplishments of partners. The workshop continued for the remainder of the month with meetings to discuss goals and actions that informed the creation of the newest 2021 Hawai'i Marine Debris Action Plan (Action Plan). This new Action Plan was built through the collaborative efforts of 48 contributing organizations.

Action Plan Structure

Action Plan Purpose

The purpose of the Hawai'i Marine Debris Action Plan is to reduce the ecological, health and safety, and economic impacts of marine debris in Hawai'i by 2031.

Goals

This Action Plan is organized by four goals that have been identified by the local marine debris community. It is important to note that since 2016, Hawai'i Marine Debris Action Plan partners have prioritized prevention within the Action Plan and emphasized the importance of addressing the issue of marine debris through proactive approaches.

Goal 1: Prevention

Goal 2: Ocean-based Marine Debris

Goal 3: Removal

Goal 4: Research

Strategies

In this Action Plan, each goal contains several strategies for how it will be achieved. The 2021 Hawai'i Marine Debris Action Plan contains 23 strategies.

Actions

Actions are activities undertaken to achieve the associated strategy and goal. Hawai'i Marine Debris Action Plan partners have volunteered to contribute to actions that align with the work of their organizations. However, this does not limit any organization from sharing updates and contributing to all actions. The 2021 Hawai'i Marine Debris Action Plan contains 129 actions. The Action Plan also includes future actions. These are actions that were important to partners to document but do not currently have any organizations signed up for them. The 2021 Hawai'i Marine Debris Action Plan contains seven future actions across six strategies.

Though this document was created through a collaborative process, not all partners support or work on all actions contained herein. Actions will be carried out by interested partner organizations, and Action Plan affiliation does not constitute endorsement of all listed actions.

Metrics

In an effort to track the progress of actions and improve information gathering, the 2021 Hawai'i Marine Debris Action Plan includes metrics associated with each action. During the 2021 Hawai'i Marine Debris Action Plan workshop, participants discussed and suggested what types of metrics would be most appropriate to track success, in addition to qualitative data, depending on each organization's activities. These metrics will be collected on a bi-annual basis and are listed in the tables below.

Communication

Regular and consistent communication is an important component of creating a collaborative space. The Hawai'i Marine Debris Action Plan community will have the opportunity to share updates and engage in discussion through participation in bi-annual coordination calls and quarterly newsletters. Partners will also have the opportunity to participate in Action Plan update workshops every two years.

Partner Acronym List

BOW	Blue Ocean Warriors
DLNR DAR	Hawai'i State Department of Land and Natural Resources, Division of Aquatic Resources
DLNR DOBOR	Hawai'i State Department of Land and Natural Resources, Division of Boating and Ocean Recreation
DLNR DOCARE	Hawai'i State Department of Land and Natural Resources, Division of Conservation and Resources Enforcement
DLNR DSP	Hawai'i State Department of Land and Natural Resources, Division of State Parks
DLNR PSP	Hawai'i State Department of Land and Natural Resources, Protected Species Program
GGGI	Global Ghost Gear Initiative
HI DOT	Hawai'i Department of Transportation
HMAR	Hawaii Marine Animal Response
HPU CMDR	Hawai'i Pacific University Center for Marine Debris Research
HWF	Hawai'i Wildlife Fund
KHF	Kōkua Hawai'i Foundation
KIRC	Kaho'olawe Island Reserve Commission
MMN	Mālama Maui Nui
MOCMI	Maui Ocean Center Marine Institute
NIST	National Institute of Standards and Technology
NOAA HIHWNMS	National Oceanic and Atmospheric Administration, Hawaiian Islands Humpback Whale National Marine Sanctuary
NOAA MDP	National Oceanic and Atmospheric Administration, Marine Debris Program
NOAA ESD	National Oceanic and Atmospheric Administration, Pacific Islands Fisheries Science Center, Ecosystem Sciences Division
NOAA HCD	National Oceanic and Atmospheric Administration, Pacific Islands Regional Office, Habitat Conservation Division
NOAA MTBAP	National Oceanic and Atmospheric Administration, Pacific Islands Fisheries Science Center, Marine Turtle Biology and Assessment Program

NOAA PMNM	National Oceanic and Atmospheric Administration, Papahānaumokuākea Marine National Monument
PMDP	Papahānaumokuākea Marine Debris Project
PWF	Pacific Whale Foundation
SCH	Sustainable Coastlines Hawai'i
SFH	Surfrider Foundation Hawai'i Region
SFK	Surfrider Foundation Kaua'i Chapter
SFO	Surfrider Foundation O'ahu Chapter
UH IPRC	University of Hawai'i, International Pacific Research Center
USFWS JCNWR	United States Fish and Wildlife Service, James Campbell National Wildlife Refuge
USGS	United States Geological Survey
ZWO	Zero Waste O'ahu



Goal 1: Prevention

Prevention is key to solving the marine debris problem over time. For prevention efforts to be successful, they will need to include both waste reduction support from industry and approaches to change consumer behaviors, and account for and include all debris entering the environment. Hawai'i Marine Debris Action Plan partners continue to make progress toward preventing marine debris through multi-stakeholder collaboration in the areas of policy, information sharing, education and outreach, providing plastic alternatives, and upstream waste prevention.

HMAR staff conducts outreach to community members (Photo: HMAR).

Strategy 1.1. Change consumer behavior through outreach and education.		
Action	Contributing Organizations	Metrics
1.1.1. Use social media as a platform for outreach. Utilize #HIMarineDebris and other related hashtags to organize a collective point of information of what's going on in Hawai'i.	808 Cleanups, SFK, HPU CMDR, PWF, Sharkastics, BOW, HMAR, HWF, KHF, 4Ocean, SCH, Parley, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Qualitative • Number of posts, likes, comments, shares, level of engagement
1.1.2. Conduct education and outreach to the general public (including non-traditional target audiences), residents, military community, and visitors through, but not limited to, presentations, news events, featured speakers, and film screenings.	Oikonos, 808 Cleanups, SFK, HPU CMDR, PWF, Sharkastics, BOW, NIST, HMAR, HWF, KHF, 4Ocean, SCH, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Number of individuals engaged/served • Number of events • Number of Ocean Friendly Visitor partners

Strategy 1.1. Change consumer behavior through outreach and education.

Action	Contributing Organizations	Metrics
1.1.3. Support schools and students in going plastic-free through, but not limited to, waste audits, art contests, and eliminating single-use and disposable plastics in the cafeteria, classroom, after school activities, on campus, at home, through distance learning, and on field trips. Support and encourage student engagement in student zero waste programs and initiatives at their schools.	Oikonos, PWF, HMAR, KHF, 4Ocean, SCH, MMN, ZWO, MOCMI	<ul style="list-style-type: none"> • Number of schools engaged • Number of students engaged
1.1.4. Create a pre- and post-survey or universally shared questions to track behavior change before and after public engagement.	Oikonos, BOW, HMAR, KHF, 4Ocean, SCH	<ul style="list-style-type: none"> • Qualitative
1.1.5. Engage communities to get involved with local and international rulemaking processes.	808 Cleanups, HPU CMDR, PWF, BOW, HWF, 4Ocean, SCH, ZWO, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of people who attend events • Number of pieces of testimony submitted
1.1.6. Conduct education and outreach at schools and universities.	Oikonos, 808 Cleanups, SFK, HPU CMDR, PWF, NIST, HMAR, HWF, KHF, 4Ocean, DLNR DAR, SCH, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Number of K-12 students engaged • Number of post-secondary students engaged • Number of schools visited • Number of educators engaged
1.1.7. Provide education on alternative (e.g., reusable, compostable) products, make them accessible, and promote their use.	Oikonos, 808 Cleanups, BOW, HMAR, KHF, 4Ocean, DLNR DAR, SCH, NOAA MDP	<ul style="list-style-type: none"> • Number of individuals engaged • Number of events participated in

Strategy 1.1. Change consumer behavior through outreach and education.

Action	Contributing Organizations	Metrics
1.1.8. Work with Hawai'i Marine Debris Action Plan researchers to support one another in sharing accurate scientific information to the local community.	Oikonos, 808 Cleanups, SFK, HPU CMDR, PWF, Sharkastics, BOW, HWF, 4Ocean, DLNR DAR, SCH, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Qualitative • Number of community presentations on Hawai'i debris research
1.1.9. Educate the public on marine debris generated through the commercial fishing industry, encourage increased understanding of where seafood comes from and how to support local fishers.	808 Cleanups, HPU CMDR, PWF, NOAA HCD, HMAR, KHF, 4Ocean, DLNR DAR, SCH, MOCMI	<ul style="list-style-type: none"> • Number of individuals engaged • Number of events participated in
1.1.10. Conduct education on composting for both home and commercial options.	SCH	<ul style="list-style-type: none"> • Qualitative • Number of individuals engaged • Number of events participated in

Strategy 1.2. Partner with businesses and industry to support waste reduction efforts.

Action	Contributing Organizations	Metrics
1.2.1. Certify 100 restaurants to be Ocean Friendly .	SFH	<ul style="list-style-type: none"> • Number of Ocean Friendly Restaurants certified
1.2.2. Work with restaurants and the Department of Health to educate the public on what Bring Your Own containers are allowed for takeout.	KHF	<ul style="list-style-type: none"> • Qualitative
1.2.3. Form a dedicated coalition to work with the Department of Health to revise Bring Your Own container rules.	SCH, ZWO	<ul style="list-style-type: none"> • Qualitative

Strategy 1.2. Partner with businesses and industry to support waste reduction efforts.

Action	Contributing Organizations	Metrics
1.2.4. Continue the development of or follow up on the actions of the Plastics Source Reduction Working Group.	4Ocean, SCH, ZWO	<ul style="list-style-type: none"> Qualitative
1.2.5. Support government and businesses that include, but are not limited to, the visitor industry and hotels, film industry, and faith-based organizations in adopting zero waste and plastic waste reduction efforts for conferences, large gatherings, events, and operations.	HMAR, HWF, KHF, SCH	<ul style="list-style-type: none"> Number of events Number of businesses supported
1.2.6. Support policies that establish extended producer responsibility.	PWF, BOW, HWF, DLNR DAR, SCH	<ul style="list-style-type: none"> Qualitative Number of policies supported
1.2.7. Advocate for sustainable, locally-sourced seafood and locally-sourced agriculture that is not packaged in plastics.	SCH	<ul style="list-style-type: none"> Qualitative
1.2.8. Continue plastic waste reduction conversations with the American Chemistry Council and other plastic industry stakeholders.	BOW	<ul style="list-style-type: none"> Qualitative

Strategy 1.3. Enhance coordinated efforts between state and local government and volunteer groups to create and enforce laws reducing local sources of marine debris.

Action	Contributing Organizations	Metrics
1.3.1. Continue to support laws that reduce and ban the use of single-use and disposable plastics.	SFH, 808 Cleanups, PWF, BOW, HMAR, HWF, KHF, DLNR DAR, SCH, ZWO, MOCMI	<ul style="list-style-type: none"> Qualitative (e.g., Monitor and share information on passed laws) Number of policies/laws drafted Number of policies/laws enacted

Strategy 1.3. Enhance coordinated efforts between state and local government and volunteer groups to create and enforce laws reducing local sources of marine debris.

Action	Contributing Organizations	Metrics
1.3.2. Work with state and county permitting offices to include zero waste and plastic waste reduction requirements in event applications, especially for events near the coastline or streams.	SCH	<ul style="list-style-type: none"> • Qualitative

Strategy 1.4. Deploy physical mechanisms to prevent debris.

Action	Contributing Organizations	Metrics
1.4.1. Evaluate, install new, and improve existing technologies to capture debris in waterways.	808 Cleanups, SCH	<ul style="list-style-type: none"> • Qualitative • Number of technologies evaluated • Number of technologies installed
1.4.2. Increase waste diversion receptacle options with lids at beach parks throughout the state.	4Ocean, SCH	<ul style="list-style-type: none"> • Number of receptacle installed and locations
1.4.3. Advocate for a storm drain retrofit to capture land-based trash before it reaches streams or coastal waters.	4Ocean, SCH	<ul style="list-style-type: none"> • Qualitative
1.4.4. Increase water bottle refilling stations in Hawai'i State Parks and other public spaces.	DLNR DSP	<ul style="list-style-type: none"> • Number of stations installed and locations
1.4.5. Continue to support the Kaka'ako Ocean Friendly Garden .	SFO	<ul style="list-style-type: none"> • Qualitative



Goal 2: Ocean-based Marine Debris

The North Pacific Gyre carries abandoned, lost, or otherwise discarded fishing gear and marine debris accumulations from all over the Pacific Ocean to Hawai'i. Items such as large net masses, oyster spacers, hagfish traps, fishing lines, and abandoned and derelict vessels are found in nearshore waters and along shorelines. Hawai'i Marine Debris Action Plan partners continue to address the issues of ocean-based marine debris through legislation, source identification, low-cost and convenient disposal options, and multi-agency collaboration.

Ghost net that washed up along the coastline of Moloka'i (Photo: @raftography/Rafael Bergstrom/@SustainableCoastlinesHawaii).

Strategy 2.1. Conduct education and outreach to ocean users on proper and legal waste management at sea.

Action	Contributing Organizations	Metrics
2.1.1. Create an inventory of existing domestic and international at-sea waste management policies, best management practices, and educational materials; develop new materials as needed; and identify gaps.	DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative • Number of existing educational materials • Number of educational materials developed
2.1.2. Conduct marine debris education and outreach, including waste management, to yacht owners and yacht race participants.	4Ocean	<ul style="list-style-type: none"> • Number of individuals engaged/served • Number of events participated in
2.1.3. Continue to support mandatory boater education.	HMAR, DLNR DAR, DLNR DOBOR, MOCMI	<ul style="list-style-type: none"> • Qualitative

Strategy 2.1. Conduct education and outreach to ocean users on proper and legal waste management at sea.

Action	Contributing Organizations	Metrics
2.1.4. Conduct education and outreach to commercial and local fishers related to derelict fishing gear, marine debris, proper waste management, and port reception facilities.	HPU CMDR, NOAA HCD, HMAR, HWF, 4Ocean, DLNR DAR, DLNR DOBOR, MOCMI	<ul style="list-style-type: none"> • Number of individuals engaged/served • Number of events participated in • List of languages used in the translation of messaging
2.1.5. Educate and promote consumer understanding of the marine debris costs associated with certain fisheries and seafood choices.	4Ocean, DLNR DAR, SCH, MOCMI	<ul style="list-style-type: none"> • Qualitative
2.1.6. Track the process of the proposed new recreational fishing license, and look for opportunities to engage with that process to communicate with fishers.	NOAA HCD, DLNR DAR, DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative

Strategy 2.2. Identify funding and provide low-cost and convenient disposal options for fishing gear and solid waste.

Action	Contributing Organizations	Metrics
2.2.1. Coordinate the placement and transport of solid waste and hard plastics reception bins for upcycling statewide.	DLNR DOBOR	<ul style="list-style-type: none"> • Number of bins installed and locations • Pounds of hard plastics received/ recycled
2.2.2. Provide net pick-up and disposal for ocean users that bring nets ashore.	808 Cleanups, SFH, BOW, HMAR, HWF, DLNR DAR, 4Ocean, SCH, DLNR DOBOR, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of reports/ responses • Number of nets removed • Pounds of nets removed

Strategy 2.2. Identify funding and provide low-cost and convenient disposal options for fishing gear and solid waste.

Action	Contributing Organizations	Metrics
2.2.3. Research, design, and install marine debris and net reception bins along windward locations throughout the state and coordinate maintenance agreements.	SFK, NOAA HCD, HWF, DLNR DAR, 4Ocean, SCH, DLNR DOBOR, MOCMI	<ul style="list-style-type: none"> • Number of bins installed and locations • Pounds of marine debris received
2.2.4. Educate local fishers with complementary signage about disposal options (e.g., sea bins).	NOAA HCD, HMAR, HWF, DLNR DAR, 4Ocean, DLNR DOBOR, MOCMI	<ul style="list-style-type: none"> • Number of signs • Number of local fishers talked to
2.2.5. Install fishing line recycling bins and signage at high recreational fishing locations throughout the state and coordinate maintenance agreements.	NOAA HCD, BOW, HMAR, HWF, Hawai'i Fishing and Boating Association, DLNR DOBOR, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Number of bins and signage • List of locations
2.2.6. Partner in the Hawai'i Nets-to-Energy program .	HPU CMDR, NOAA MDP, Schnitzer Steel, Covanta Energy, Pacific Ocean Producers, BOW, HWF, DLNR DAR, 4Ocean, SCH, NOAA ESD, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Qualitative • Pounds of nets received and processed/incinerated

Strategy 2.3. Identify fishing materials and practices designed to reduce marine debris.

Action	Contributing Organizations	Metrics
2.3.1. Gather and share best management practices for coastline fishing gear and methods.	NOAA HCD, HMAR, HWF, DLNR DAR, 4Ocean, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of best management practices identified
2.3.2. Learn more about smart fish aggregating devices. Analyze the devices' impacts and develop ways to identify the source fishery or vessel.	HPU CMDR, DLNR DAR, 4Ocean	<ul style="list-style-type: none"> • Qualitative
2.3.3. Gather and share community-based and culture-based information on sustainable fishing practices.	NOAA HCD, DLNR DAR, SCH, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of best management practices identified

Strategy 2.4. Create public-private partnerships to develop industry standards for reducing marine debris.

Action	Contributing Organizations	Metrics
2.4.1. Identify and communicate with fishing, maritime, military, shipping, cruise ship, and tourism industry partners to encourage and incentivize the reduction of marine debris.	SFH, BOW, HWF, DLNR DAR, 4Ocean, SCH, MOCMI	<ul style="list-style-type: none"> • Qualitative
2.4.2. Participate and engage with Pacific and regional partnerships around industry standards for reducing marine debris.	HPU CMDR, NOAA MDP, SFH	<ul style="list-style-type: none"> • Qualitative • Number of partnerships
2.4.3. Collaborate with international fisheries to reduce ocean-based marine debris.	HPU CMDR, NOAA MDP	<ul style="list-style-type: none"> • Qualitative
2.4.4. Engage with fisheries and gear manufacturers that are determined to be the source of derelict fishing gear washing into Hawai'i.	HPU CMDR	<ul style="list-style-type: none"> • Number of workshops • Number of reports describing mitigation or prevention strategies • Funding amounts for restoration, remediation, and prevention strategies

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

Action	Contributing Organizations	Metrics
2.5.1. Continue enforcement against illegal fishing gear.	HMAR, DLNR DAR, DLNR DOCARE	<ul style="list-style-type: none"> • Qualitative
2.5.2. Continue to support legislation on reducing ocean dumping.	DLNR DAR	<ul style="list-style-type: none"> • Qualitative

Strategy 2.6. Prevent and identify abandoned and derelict vessels.

Action	Contributing Organizations	Metrics
2.6.1. Suggest draft legislation to require mandatory insurance for vessels under 26 feet through the state registration process or documented by the United States Coast Guard (>26 feet already required).	DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative
2.6.2. Promote boater hurricane and tsunami preparedness with a focus on preventing marine debris.	DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative • Number of materials developed • Number of individuals trained during in-person or online boater education
2.6.3. Explore opportunities to minimize potential issues that may arise during the 30-day abandoned and derelict vessel owner notification and waiting periods.	Makanakai Marine Services, DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative

Strategy 2.7. Effectively respond to abandoned and derelict vessels.

Action	Contributing Organizations	Metrics
2.7.1. Support a dedicated marine debris coordinator position within DLNR.	808 Cleanups, HPU CMDR, SFH, DLNR DAR, 4Ocean, SCH, DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative
2.7.2. Enhance interagency coordination for addressing abandoned and derelict vessels and maintain an abandoned and derelict vessel inventory for remote or difficult to access coastlines.	HMAR, DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative
2.7.3. Create and identify an abandoned and derelict vessel situational response contact, and update it biennially.	DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative

Strategy 2.7. Effectively respond to abandoned and derelict vessels.

Action	Contributing Organizations	Metrics
2.7.4. Revisit discussions to establish a memorandum of understanding or standard operating procedure with the United States Coast Guard for a more collaborative approach to address abandoned and derelict vessels at sea.	DLNR DOBOR	<ul style="list-style-type: none">• Qualitative

Strategy 2.8. Develop sustainable funding mechanisms and resources for vessel removal and disposal.

Action	Contributing Organizations	Metrics
2.8.1. Propose a rule/amendment to charge a disposal fee at the time of vessel transfer or first time registration to help establish a response fund.	DLNR DOBOR	<ul style="list-style-type: none">• Qualitative
2.8.2. Develop the capacity to properly dispose of old vessels, such as a vessel turn-in program, and make these disposal options publicly available.	DLNR DOBOR	<ul style="list-style-type: none">• Qualitative



Goal 3: Removal

Conducting shoreline, near-shore, and other in-water debris removal is imperative to reducing the immediate threats and harm caused by marine debris. Removal operations range from large-scale community beach cleanups to targeted net patrols, long-term missions at sea, and small socially-distanced and solo activities. Through dedicated and consistent removal efforts, Hawai'i Marine Debris Action Plan partners continue to remove thousands of pounds of marine debris every year.

Volunteer workday at Kāwā estuary on Hawai'i Island (Photo: Hawai'i Wildlife Fund).

Strategy 3.1. Utilize effective methods to locate marine debris accumulations.

Action	Contributing Organizations	Metrics
3.1.1. Continue to support the advancement of at-sea detection for marine debris through remote sensing.	HPU CMDR	<ul style="list-style-type: none"> • Qualitative
3.1.2. Work with partners to assist across the Hawaiian Islands for in-land, coastal, and at-sea marine debris detection.	SFK, HPU CMDR, 808 Cleanups, HMAR, HWF, DLNR DAR, KIRC, SCH, USFWS JCNWR, NOAA ESD, MOCMI	<ul style="list-style-type: none"> • Qualitative
3.1.3. Continue monitoring efforts in the Papahānaumokuākea Marine National Monument to identify accumulation sites.	NOAA ESD, NOAA PMNM, PMDP	<ul style="list-style-type: none"> • Qualitative • Number of accumulation sites • Number of surveys completed
3.1.4. Continue to work with vessels of opportunity on at-sea visual surveys for large floating marine debris in the North Pacific.	PWF	<ul style="list-style-type: none"> • Qualitative • Number of visual surveys completed

Strategy 3.1. Utilize effective methods to locate marine debris accumulations.

Action	Contributing Organizations	Metrics
3.1.5. Implement and educate partners about the observing system as described in Toward the Integrated Marine Debris Observing System .	UH IPRC	<ul style="list-style-type: none"> Qualitative
3.1.6. Conduct annual aerial shoreline surveys and ground truthing.	DLNR DAR, SCH, USFWS JCNWR	<ul style="list-style-type: none"> List of islands surveyed Miles of coastlines surveyed
3.1.7. Tag derelict fishing gear with GPS buoys to determine their location and potential marine debris accumulations.	UH IPRC, HMAR, DLNR DAR	<ul style="list-style-type: none"> Number of nets tagged

Strategy 3.2. Coordinate effective systems for reporting and responding to marine debris.

Action	Contributing Organizations	Metrics
3.2.1. Continue to coordinate with partners to report marine debris through the DLNR DOBOR Marine Debris Report Form and call or text the hotline (808) 587-0405. Increase public awareness of this form (e.g., through signs at boat ramps, state parks, and website promotion through social media).	808 Cleanups, HPU CMDR, BOW, HMAR, HWF, DLNR DAR, KIRC, SCH, USFWS JCNWR, DLNR DOBOR, MOCMI	<ul style="list-style-type: none"> Number of reports per year Number of organizations that responded and time it took for successful removal
3.2.2. Maintain and promote marine debris hotlines utilized by the nongovernmental organization community.	808 Cleanups, SFK, BOW, HMAR, HWF, KIRC, SCH, MOCMI	<ul style="list-style-type: none"> Qualitative Number of reports per year

Strategy 3.3. Use available information to prioritize cleanup sites.

Action	Contributing Organizations	Metrics
3.3.1. Continue to identify and prioritize cleanup sites and debris types on each island.	Pūlama Lāna'i, 808 Cleanups, HPU CMDR, SFK, Sharkastics, BOW, Litterati, HMAR, HWF, SCH, MMN, MOCMI	<ul style="list-style-type: none"> Qualitative

Strategy 3.3. Use available information to prioritize cleanup sites.

Action	Contributing Organizations	Metrics
3.3.2. Continue engagement with county, state, and federal marine wildlife representatives regarding their high-priority regions/ seasons by island.	SFK, Sharkastics, HMAR, DLNR PSP, KIRC, SCH, USFWS JCNWR, MOCMI	<ul style="list-style-type: none"> • Qualitative
3.3.3. Share data and information amongst partners that organizations are collecting and using to inform the prioritization of cleanup sites (e.g., HWF wildlife monitoring form).	Pūlama Lāna'i, 808 Cleanups, SFK, Sharkastics, BOW, Litterati, HWF, KIRC, SCH, USFWS JCNWR, MOCMI	<ul style="list-style-type: none"> • Qualitative

Strategy 3.4. Develop capacity for marine debris removal and disposal.

Action	Contributing Organizations	Metrics
3.4.1. Create and update island-specific flow chart options depicting the disposal and collaboration process.	HPU CMDR, 808 Cleanups, HMAR, DLNR DAR, KIRC	<ul style="list-style-type: none"> • Qualitative
3.4.2. Continuously reevaluate a preferred marine debris disposal hierarchy within the state as informed by research.	808 Cleanups, BOW, Litterati, HWF, SCH	<ul style="list-style-type: none"> • Qualitative
3.4.3. Expand the development and capacity to repurpose and recycle salvaged marine debris into infrastructure, materials, and products across all islands.	SFK, HPU CMDR, Sharkastics, HWF, SCH, MMN, Parley, PMDP	<ul style="list-style-type: none"> • Qualitative • Number of different repurposing or recycling efforts • Tons of material repurposed
3.4.4. Encourage the use of sustainable/ reusable supplies during cleanups through partnerships with stables, breweries, coffee companies, etc. Similarly, encourage zero waste efforts for snacks and beverages distributed at cleanups.	808 Cleanups, PWF, Sharkastics, BOW, HWF, KIRC, SCH, MMN, ZWO, PMDP	<ul style="list-style-type: none"> • Qualitative

Strategy 3.4. Develop capacity for marine debris removal and disposal.

Action	Contributing Organizations	Metrics
3.4.5. Continue to work with the county to allow marine debris to be accepted at convenience centers and transfer stations.	808 Cleanups, SFK, HWF, SCH, Parley	<ul style="list-style-type: none"> • Qualitative • Number of collection bins and locations • Exemption procedure put in place for fees and other challenges
3.4.6. Develop a task force on each island to respond to derelict net masses.	HPU CMDR, 808 Cleanups, SFK, Sharkastics, BOW, HMAR, DLNR DAR, SCH, MOCMI, PMDP	<ul style="list-style-type: none"> • Number of task forces or islands with a task force • Number of responses
3.4.7. Conduct meetings with state and county partners to investigate opportunities to build removal capacity.	808 Cleanups, HPU CMDR, DLNR DAR, SCH, DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative
3.4.8. Create a shared understanding, within and outside of the Hawai'i Marine Debris Action Plan community, on what happens to debris after disposal (e.g., nets to energy, recycling).	808 Cleanups, HPU CMDR, BOW, DLNR DAR, SCH, NOAA MDP	<ul style="list-style-type: none"> • Qualitative

Strategy 3.5. Increase communication and collaboration to efficiently remove marine debris.

Action	Contributing Organizations	Metrics
3.5.1. Identify an effective communication system to coordinate the removal of reported debris.	808 Cleanups, HPU CMDR, BOW, HMAR, DLNR DAR, KIRC	<ul style="list-style-type: none"> • Qualitative
3.5.2. Gather and disseminate statewide cleanup information through a centralized platform.	808 Cleanups, HPU CMDR, DLNR DAR	<ul style="list-style-type: none"> • Qualitative
3.5.3. Communicate and collaborate with North Pacific organizations to remove marine debris.	HPU CMDR, 808 Cleanups	<ul style="list-style-type: none"> • Qualitative • Number of partners or list of partners

Strategy 3.5. Increase communication and collaboration to efficiently remove marine debris.

Action	Contributing Organizations	Metrics
3.5.4. Provide financial and logistic support for large-scale marine debris removal in the Papahānaumokuākea Marine National Monument	NOAA ESD, NOAA PMNM, PMDP, NOAA MDP	<ul style="list-style-type: none"> • Qualitative • Funding amounts
3.5.5. Continue to facilitate, coordinate, and conduct regularly scheduled shoreline, in-water, and stream cleanups and net patrols.	Pūlama Lāna'i, 808 Cleanups, HPU CMDR, PWF, BOW, HMAR, HWF, DLNR DAR, KIRC, USFWS JCNWR, MMN, DLNR DOBOR	<ul style="list-style-type: none"> • Qualitative • Number of cleanups • Pounds removed
3.5.6. Develop and maintain a network of nongovernmental organizations and other partner on-water resources that can perform regular near-shore debris mass surveys, removal training, and removal operations, and coordinate disposal of debris found with shore-based cleanup partners.	HMAR	<ul style="list-style-type: none"> • Qualitative



Goal 4: Research

The marine debris issue has rapidly evolved, and researchers around the world are constantly working to better understand it. Researchers in Hawai'i have made great strides, helping to develop this field of study and create new research opportunities. Their shared capabilities and comprehension of sourcing, polymer identification, and tracking, have increased along with their research contributions. Hawai'i Marine Debris Action Plan partners are poised to build off of their accomplishments and momentum to continue to make strides in the field of marine debris research.

CMDR researchers and students kickoff a two-year study investigating the degradation of plastics in the marine environment (Photo: Jenna Karr, M.S. Center for Marine Debris Research).

Strategy 4.1. Develop an understanding of marine debris physical and chemical traits, life cycle, sources, transport, fate, quantity, and accumulation rate.

Action	Contributing Organizations	Metrics
4.1.1. Conduct shoreline and in-water surveys regularly, and share data and survey methods to determine accumulation rates.	SFK, HPU CMDR, PWF, Sharkastics, BOW, HWF, HMAR, SCH, MOCMI	<ul style="list-style-type: none"> • Number of surveys conducted • Number of new participants
4.1.2. Continue to model and forecast marine debris movement in the Pacific Ocean, and incorporate local dynamics.	HPU CMDR	<ul style="list-style-type: none"> • Qualitative
4.1.3. Establish partnerships for an at-sea monitoring program.	UH IPRC, HPU CMDR	<ul style="list-style-type: none"> • Qualitative
4.1.4. Utilize spatial mapping to compare areas of high removal effort to standing debris accumulations in order to evaluate the impact of cleanups and site monitoring.	808 Cleanups, SCH	<ul style="list-style-type: none"> • Qualitative
4.1.5. Encourage citizen/community science efforts and public participation in research and data collection.	Oikonos, 808 Cleanups, HPU CMDR, SFK, PWF, BOW, Litterati, HWF, HMAR, SCH, MMN, MOCMI, NOAA MDP	<ul style="list-style-type: none"> • Qualitative • Number of citizen/community science participants

Strategy 4.1. Develop an understanding of marine debris physical and chemical traits, life cycle, sources, transport, fate, quantity, and accumulation rate.

Action	Contributing Organizations	Metrics
4.1.6. Research marine debris human health impacts and share publicly.	HPU CMDR	<ul style="list-style-type: none"> • Qualitative
4.1.7. Better identify sources of hagfish traps to determine the best prevention efforts.	SFK	<ul style="list-style-type: none"> • Qualitative
4.1.8. Create a database of derelict fishing gear types and metrics in Hawai'i in order to try and identify the fishery or manufacturer sources.	HPU CMDR	<ul style="list-style-type: none"> • Number of samples in database • Percentage of samples sourced • Number of publications • Number of partners willing to share data • Number of publication reads • Number of citations
4.1.9. Inventory plastic debris in air, water, sediment, and shorelines across an entire Hawaiian watershed.	HPU CMDR	<ul style="list-style-type: none"> • Qualitative
4.1.10. Test the efficiency of beach remediation of microplastics using Seed.World engineered Buoyancy Separation Device and Trash Time Machine.	HPU CMDR, Seed.World	<ul style="list-style-type: none"> • Accuracy of inventions • Number publications
4.1.11. Identify funding to continue sourcing derelict fishing gear marine debris and scaling up a centralized detection, removal, research, and repurposing program.	HPU CMDR	<ul style="list-style-type: none"> • Funding amounts • Tons of debris studied • Tons of debris repurposed

Strategy 4.1. Develop an understanding of marine debris physical and chemical traits, life cycle, sources, transport, fate, quantity, and accumulation rate.

Action	Contributing Organizations	Metrics
4.1.12. Design a proof of concept study for an early warning forecast of pulses of marine debris washing close to Hawai'i and track them from satellite imagery or other technologies with the purpose of salvaging large derelict fishing gear before it strikes and damages the reef.	HPU CMDR	<ul style="list-style-type: none"> • Accuracy of forecasting model • Success of tracking one item and intercepting it with a boat
4.1.13. Develop a chemical timestamp to know the time a plastic item has been in the environment.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Confidence intervals on accurate age • Number of publications
4.1.14. Investigate buoyancy, biofilm, structural, and chemical changes in three less dense polymers during outdoor weathering in Hawai'i.	HPU CMDR, NIST, The Ocean Cleanup	<ul style="list-style-type: none"> • Number of polymers assessed • Number of time points measured • Number of publications
4.1.15. Conduct a life cycle analysis of plastics used in fishing gear.	HPU CMDR	<ul style="list-style-type: none"> • Qualitative

Strategy 4.2. Develop or identify standardized methods or best management practices for applicable aspects of research to ensure data can be meaningfully analyzed.

Action	Contributing Organizations	Metrics
4.2.1. Develop standardized laboratory methods.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Qualitative • Number of methods developed
4.2.2. Identify standardized sampling methods for different environmental compartments, including but not limited to, water, sediment, and biota.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Qualitative • Number of methods developed

Strategy 4.2. Develop or identify standardized methods or best management practices for applicable aspects of research to ensure data can be meaningfully analyzed.

Action	Contributing Organizations	Metrics
4.2.3. Identify methods for quality control to minimize and eliminate sample contamination.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Qualitative • Number of methods developed
4.2.4. Identify a shared set of standardized information for organizations to collect from cleanup activities for comparable analysis.	HPU CMDR, NIST, 808 Cleanups, Sharkastics, HWF, HMAR, SCH, MMN	<ul style="list-style-type: none"> • Qualitative
4.2.5. Identify standardized shoreline and in-water monitoring protocols throughout Hawai'i.	HPU CMDR, 808 Cleanups, Sharkastics, HWF, HMAR, SCH, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of trainings • Number of participants per training
4.2.6. Develop innovative and accurate methods to quantify nanoplastics.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Accuracy and precision of method • Number of publications
4.2.7. Develop methods to quantify plastic additives in environmental samples.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Number of compounds included in targeted analysis • Accuracy and precision of method • Number of publications
4.2.8. Develop a method to identify gear types from derelict fishing gear.	HPU CMDR	<ul style="list-style-type: none"> • Number of gear types identified to fishery or gear manufacturer • Number of publications

Strategy 4.3. Enhance and advance research on the ecological impacts of marine debris.

Action	Contributing Organizations	Metrics
4.3.1. Research the interaction of invasive species with marine debris, including species identification, impacts, transport, and fate.	UH IPRC, SFK, DLNR DAR	<ul style="list-style-type: none"> • Qualitative • Number of invasive species identified • List of invasive species identified
4.3.2. Conduct research on the biological effects of plastic ingestion.	Oikonos, HPU CMDR, NIST, NOAA MTBAP, USGS, HMAR	<ul style="list-style-type: none"> • Qualitative • Number of publications
4.3.3. Monitor and assess information on the impacts of entanglement on wildlife.	HPU CMDR, NIST, NOAA, USGS, PWF, NOAA HIHWNMS, Sharkastics, HMAR, HWF, DLNR DAR, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of publications • Number of reported marine debris entanglements
4.3.4. Monitor and assess information on the impacts of marine debris to habitats.	HPU CMDR, The Nature Conservancy, GGGI, HMAR, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of publications
4.3.5. Find funding for long-term monitoring programs for sea surface, shoreline, ingestion, and entanglement metrics for nano- to megaplastics.	HPU CMDR, NIST	<ul style="list-style-type: none"> • Funding amounts • Number of long-term programs started • Number of projects sustained and for number of years
4.3.6. Use structure from motion imagery to quantify the volume of coral reef damage by derelict fishing gear strikes in Kāneʻohe Bay.	HPU CMDR	<ul style="list-style-type: none"> • Number of acres of reef imaged before net strikes • Number of net strikes monitored • Number of times each net strike is monitored • Sensitivity/ resolution of method
4.3.7. Assess the impacts of drifting fish aggregating devices to sea turtles in the Pacific.	HPU CMDR	<ul style="list-style-type: none"> • Qualitative

Strategy 4.4. Improve research on the economic impacts of marine debris.

Action	Contributing Organizations	Metrics
4.4.1. Identify the economic impacts of plastic reduction policies.	SFH	<ul style="list-style-type: none"> • Qualitative • Number of publications/reports • Cost savings
4.4.2. Identify the economic impacts of marine debris to the Hawai'i tourism industry, local businesses, cleanup organizations, municipalities, and residents.	BOW, ZWO	<ul style="list-style-type: none"> • Qualitative • Cost savings
4.4.3. Research needs and solutions towards increased recycling and a circular economy.	HPU CMDR, HI DOT, BOW, NIST, MMN	<ul style="list-style-type: none"> • Qualitative
4.4.4. Develop a further understanding of the supply chain valuation in Hawai'i.	HPU CMDR, Salt Lofoten AS	<ul style="list-style-type: none"> • Qualitative
4.4.5. Research the economic impacts of derelict fishing gear in Hawai'i.	HPU CMDR, GGGI, BOW	<ul style="list-style-type: none"> • Qualitative
4.4.6. Develop an optimal compatibilizer to recycle High Density Polyethylene marine debris into asphalt roads in Hawai'i.	HPU CMDR, HI DOT	<ul style="list-style-type: none"> • Qualitative

Strategy 4.5. Evaluate the effectiveness of mitigation, outreach, and removal efforts of marine debris.

Action	Contributing Organizations	Metrics
4.5.1. Investigate effectiveness of new plastic reduction policies.	HPU CMDR, Sharkastics, PWF, SCH	<ul style="list-style-type: none"> • Qualitative
4.5.2. Investigate the effectiveness of marine debris and plastic education and outreach.	Oikonos, SCH	<ul style="list-style-type: none"> • Qualitative • Number of students engaged • Number of teachers engaged

Strategy 4.5. Evaluate the effectiveness of mitigation, outreach, and removal efforts of marine debris.

Action	Contributing Organizations	Metrics
4.5.3. Calculate annual removal quantities from James Campbell National Wildlife Refuge using systematically collected data.	HPU CMDR	<ul style="list-style-type: none"> Confidence intervals Number of publications

Strategy 4.6. Support communication and collaboration of research to all stakeholders.

Action	Contributing Organizations	Metrics
4.6.1. Improve collaboration and data sharing amongst the local marine debris community through the publishing, compiling, and sharing of marine debris research completed in Hawai'i state and regional waters.	Oikonos, UH IPRC, SFK, HPU CMDR, NIST, 808 Cleanups, PWF, BOW, HWF, DLNR DAR, SCH, MOCMI	<ul style="list-style-type: none"> Qualitative Number of publications or reports Number of new partnerships Number of new joint projects
4.6.2. Regularly hold a Hawai'i Marine Debris Action Plan research workshop or symposium to communicate and share Hawai'i-based research projects, and identify research priorities.	HPU CMDR, NIST	<ul style="list-style-type: none"> Qualitative Number of participants
4.6.3. Grow research capacity for Hawai'i-based organizations to collaborate and bridge gaps to be the world's leader in marine debris research.	HPU CMDR, NIST	<ul style="list-style-type: none"> Qualitative
4.6.4. Explore and share funding opportunities, and develop partnerships to approach funding opportunities.	DLNR DAR, NOAA MDP	<ul style="list-style-type: none"> Qualitative
4.6.5. Collaborate with international partners for marine debris research.	Oikonos, UH IPRC, HPU CMDR, NIST, HWF	<ul style="list-style-type: none"> Qualitative Number of partners
4.6.6. Participate in international conferences, partnerships, and other avenues of information sharing to highlight the relevance of marine debris in Hawai'i.	SFK, HPU CMDR, NIST, 808 Cleanups, PWF, Sharkastics, BOW, HMAR, HWF, SCH, MOCMI	<ul style="list-style-type: none"> Number of symposiums participated in

Strategy 4.6. Support communication and collaboration of research to all stakeholders.

Action	Contributing Organizations	Metrics
4.6.7. Compile and communicate standardized information and other data from cleanup activities.	808 Cleanups, Sharkastics, Litterati, HMAR, SCH, MOCMI	<ul style="list-style-type: none"> • Qualitative • Number of cleanup organization's datasets
4.6.8. Publish five concurrent review articles in the North Pacific (sea surface, sediment, shoreline, ingestion, entanglement).	HPU CMDR, NIST	<ul style="list-style-type: none"> • Number of reviews published
4.6.9. Transfer techniques and technology to others internationally (e.g., Open Specy, Polymer Kit 1.0, NIST Standard Reference Materials).	HPU CMDR, NIST	<ul style="list-style-type: none"> • Qualitative

Appendix A: Future Actions

The following actions do not currently have any organizations signed up for them but were important to partners to document. The 2021 Hawai'i Marine Debris Action Plan contains seven future actions across six strategies.

Strategy 1.4. Deploy physical mechanisms to prevent debris.

Action

Increase curbside recycling on all islands.

Increase access to plastic recycling on Hawai'i Island and expand resources statewide.

Strategy 2.2. Identify funding and provide low-cost and convenient disposal options for fishing gear and solid waste.

Action

Report the adequacy of port reception facilities and general user compliance with MARPOL V regulations.

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

Action

Coordinate a meeting on monitoring/training against illegal discharge at sea.

Strategy 4.4. Improve research on the economic impacts of marine debris.

Action

Research the implications and impacts to water and air quality standards from plastic, a regulated pollutant, along the removal, recycling, incineration, and disposal lifecycle.

Strategy 4.5. Evaluate the effectiveness of mitigation, outreach, and removal efforts of marine debris.

Action

Test the unintended environmental consequences of eco-alternatives.

Strategy 4.6. Support communication and collaboration of research to all stakeholders.

Action

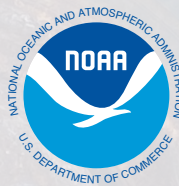
Compile and maintain a researcher contact list organized by research focal areas to support communication.

Appendix B: Workshop Participants

The Hawai'i Marine Debris Action Plan was built and maintained through a collaborative process. Virtual workshop participants represented a wide range of organizations whose work all intersect around marine debris. The following organizations participated in the March 2021 virtual workshop:

Organization
808 Cleanups
Beach Environmental Awareness Campaign Hawai'i
Blue Ocean Warriors
Hawai'i Department of Transportation
Hawaii Marine Animal Response
Hawai'i Pacific University Center for Marine Debris Research
Hawai'i State Department of Health
Hawai'i State Department of Land and Natural Resources, Division of Aquatic Resources
Hawai'i State Department of Land and Natural Resources, Division of Boating and Ocean Recreation
Hawai'i State Department of Land and Natural Resources, Division of Conservation and Resources Enforcement
Hawai'i State Department of Land and Natural Resources, Division of State Parks
Hawai'i State Department of Land and Natural Resources, Native Ecosystems Protection and Management, Moloka'i
Hawai'i State Department of Land and Natural Resources, Protected Species Program
Hawai'i Wildlife Fund
Kaho'olawe Island Reserve Commission
Kōkua Hawai'i Foundation Plastic Free Hawai'i Program
Lynker Technologies
Makamae's Plastics, LLC, DBA Precious Plastics Hawai'i
Mālama Maui Nui
Maui Ocean Center Marine Institute
National Institute of Standards and Technology
National Oceanic and Atmospheric Administration, Hawaiian Islands Humpback Whale National Marine Sanctuary

National Oceanic and Atmospheric Administration, Marine Debris Program
National Oceanic and Atmospheric Administration, Pacific Islands Fisheries Science Center, Ecosystem Sciences Division
National Oceanic and Atmospheric Administration, Pacific Islands Regional Office, Habitat Conservation Division
National Oceanic and Atmospheric Administration, Pacific Islands Fisheries Science Center, Marine Turtle Biology and Assessment Program
National Oceanic and Atmospheric Administration, Papahānaumokuākea Marine National Monument
Ocean Defenders Alliance
Ocean Voyages Institute
Pacific Whale Foundation
Papahānaumokuākea Marine Debris Project
Parley for the Oceans
Pūlama Lānaʻi
SHARKastics
Surfrider Foundation Hawaiʻi Region
Surfrider Foundation Kauaʻi Chapter
Surfrider Foundation Oʻahu Chapter
Sustainable Coastlines Hawaiʻi
The Ocean Cleanup
United States Coast Guard
United States Fish and Wildlife Service, James Campbell National Wildlife Refuge
University of Hawaiʻi, International Pacific Research Center
University of Hawaiʻi at Hilo
Zero Waste Oʻahu



Gina M. Raimondo
United States Secretary of Commerce

Dr. Richard W. Spinrad
Under Secretary of Commerce for Oceans and Atmosphere
and NOAA Administrator

Nicole R. LeBoeuf
Assistant Administrator for Ocean Services
and Coastal Zone Management