



2018 Hawai'i Marine Debris Action Plan

January 2019

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Acknowledgement

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For more information, please contact:

NOAA Marine Debris Program
Office of Response and Restoration
National Ocean Service
NOAA Inouye Regional Center
NOS/Office for Coastal Management
1845 Wasp Blvd., Bldg 176
Honolulu, HI 96818
<https://MarineDebris.noaa.gov/>

Mark Manuel, Pacific Islands Regional Coordinator
mark.manuel@noaa.gov

Shanelle Naone, Pacific Islands Marine Debris Communications & Outreach Coordinator
shanelle.naone@noaa.gov

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Executive Summary

Hawai'i has and continues to experience high volumes of marine debris across all islands. Numerous types of debris, such as derelict fishing gear and single-use consumer plastic products, litter our shorelines and are a great risk to the islands' delicate ecosystems, marine life, economy, and community health. Dedicated organizations regularly work to address the issue of marine debris in Hawai'i through education, prevention, removal, and research efforts.

Since 2010, various Hawai'i marine debris stakeholders have come together to create and engage in the Hawai'i Marine Debris Action Plan (HI-MDAP). The purpose of the HI-MDAP is to reduce the ecological, health and safety, and economic impacts of marine debris in Hawai'i by 2020. It is through this document that HI-MDAP partners coordinate efforts by articulating shared goals, strategies to achieve those goals, and corresponding actions.

The HI-MDAP is comprised of five goals:

1. Reduce Sources of Marine Debris through Prevention
2. Reduce the Amount and Impacts of Ocean-Based Marine Debris
3. Support and Sustain Marine Debris Removal
4. Increase Capacity to Address Abandoned and Derelict Vessels (ADV's)
5. Conduct High Quality Research to Understand Marine Debris

The HI-MDAP was designed as a living document that is updated every two years. As the issue of marine debris changes, so does this plan. The 2018 HI-MDAP update workshop was held on August 13-14, 2018 and was hosted by the National Oceanic and Atmospheric Administration (NOAA). The two-day workshop provided a time and space for partners to discuss the current state of the HI-MDAP and propose updates and changes. Forty HI-MDAP partner representatives attended the workshop in person. The following 2018 HI-MDAP serves as the last update in the current ten-year action plan.

Organization Acronym List

HI-MDAP partners are diverse and include representation from federal, state, and local governments, non-governmental organizations, academia, and the private sector.

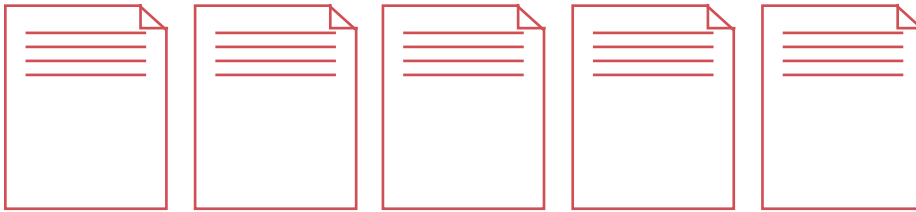
808	808 Cleanups
CCH	City and County of Honolulu
DLNR DOBOR	Department of Land and Natural Resources, Division of Boating and Ocean Recreation
DLNR DOCARE	Department of Land and Natural Resources, Division of Conservation and Resources Enforcement
DLNR DAR	Department of Land and Natural Resources, Division of Aquatic Resources
DLNR LD	Department of Land and Natural Resources, Land Division
DOH	Department of Health
DOT	Department of Transportation
GGGI	Global Ghost Gear Initiative
HECC	Hawai'i Environmental Cleanup Coalition
HLA	Hawaii Longline Association
HOST	Hawaii Ocean Safety Team
HPU	Hawai'i Pacific University
HTA	Hawai'i Tourism Authority
HWF	Hawai'i Wildlife Fund
IUCN	International Union for Conservation of Nature
KHIB	Keep the Hawaiian Islands Beautiful
KHF	Kōkua Hawai'i Foundation
KIRC	Kaho'olawe Island Reserve Commission
NKK	Nā Kama Kai
OC	Ocean Conservancy
OP CZMP	Office of Planning, Coastal Zone Management Program

PICES	North Pacific Marine Science Organization
POP	POP Fishing & Marine
PWF	Pacific Whale Foundation
Surfrider (Island)	Surfrider Foundation, Surfrider Kaua'i, Surfrider O'ahu, Surfrider Maui
SCH	Sustainable Coastlines Hawai'i
Maui County	Maui County Office of Economic Development
MHF	Maui Huliau Foundation
MLC	Mālama Learning Center
MOCMI	Maui Ocean Center Marine Institute
NIST	National Institute of Standards and Technology
NOAA ESD	National Oceanic and Atmospheric Administration, Ecosystem Sciences Division
NOAA DARRP	National Oceanic and Atmospheric Administration, Damage Assessment, Remediation, and Restoration Program
NOAA HIHWNMS	National Oceanic and Atmospheric Administration, Hawaiian Islands Humpback Whale National Marine Sanctuary
NOAA HMSRP	National Oceanic and Atmospheric Administration, Hawaiian Monk Seal Research Program
NOAA MDP	National Oceanic and Atmospheric Administration, Marine Debris Program
NOAA NESDIS	National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service
NOAA OLE	National Oceanic and Atmospheric Administration, Office of Law Enforcement
NOAA PMNM	National Oceanic and Atmospheric Administration, Papahānaumokuākea Marine National Monument
NOAA SRC	National Oceanic and Atmospheric Administration, Southwest Restoration Center
NOAA UAS	National Oceanic and Atmospheric Administration, Unmanned Aircraft Systems Program
TPMDS	Trans Pacific Marine Debris Survey
UFA	United Fishing Agency

UH HCRI	University of Hawai'i, Hawai'i Coral Reef Initiative
UH Hilo	University of Hawai'i at Hilo
UH IPRC	University of Hawai'i, International Pacific Research Center
UH Kewalo	University of Hawai'i, Kewalo Marine Laboratory
UH SG	University of Hawai'i Sea Grant
UH UAS	University of Hawai'i Unmanned Aircraft Systems
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WPRFMC	Western Pacific Regional Fishery Management Council

Action Plan Status

By-the-Numbers



5 Revisions

The 2018 Hawai'i Marine Debris Action Plan is the fifth and final revision of the ten-year plan.

120 Total Actions

95 current/ongoing actions
25 future actions



36 Organizations

36 organizations attended the 2018 workshop; 15 of those organizations were new participants.

Communication

In an effort to track the progress of actions and create a space for partners to share updates, regularly scheduled communication is planned for the upcoming years. Communication will focus on tracking the progress of actions, solving problems, and sharing news and resources. Communication will take place through coordination calls, newsletters, action progress tables, and an online collaboration portal.

Document Structure

The following tables are the core of the Action Plan. They list strategies, ongoing and future actions, and organizations that contribute to achieving the Action Plan's goals. Appendix I contains accomplishments achieved during the 2016-18 Action Plan timeframe. Appendix II includes a list of organization representatives who attended the update workshop.



Goal 1: Reduce Sources of Marine Debris through Prevention

Thousands of single-use plastics make their way into our ocean on a daily basis. (Photo: NOAA)

Strategy 1.1 - Change consumer behavior through outreach and education

Current/Ongoing Actions

Actions	Organizations
1.1.1 Use social media as a platform for outreach to the general public. Utilize #HImarinedebris and #HIPlasticPollution to capture work being done by partners.	KHF, SCH, Surfrider O’ahu, Surfrider Kaua’i, 808, Sharkastics, HWF, HTA, MOCMI, PWF, NOAA MDP
1.1.2 Engage and educate the public through events featuring speakers, film screenings, etc.	KFH, NOAA MDP
1.1.3 Support schools in going plastic-free (e.g., eliminate single-use plastics in the cafeteria).	KHF, SCH, Surfrider O’ahu
1.1.4 Create a pre- and post-event survey or other assessment tool (choice of single-use vs. reusable item) to track behavior change.	SCH, KHF, Surfrider O’ahu, HWF, NKK
1.1.5 Empower communities to get engaged with local and international civics.	Surfrider O’ahu, Surfrider Kaua’i
1.1.6 Continue education and outreach at schools and universities, including outreach on specific items such as single-use plastics, cigarette butts, and water bottles.	HWF, Surfrider O’ahu, Surfrider Kaua’i, SCH, NOAA ESD, KHF, UH Kewalo, NKK, Sharkastics, 808, MOCMI, PWF, HPU, NIST, NOAA MDP

Strategy 1.1 - Change consumer behavior through outreach and education

Current/Ongoing Actions

Actions	Organizations
1.1.7 Conduct education and outreach to the general public, residents, and visitors through presentations, events, and booths. Make alternative products accessible and promote the use of reusable take-out containers.	UH IPRC, HWF, Surfrider O’ahu, Surfrider Kaua’i, SCH, KHF, TPMDs, DOH, OP CZMP, MLC, Sharkastics, NKK, Zero Waste O’ahu, MOCMI, PWF, HPU, NIST, KHIB, NOAA MDP
1.1.8 Work with HI-MDAP research partners to effectively relay scientific information to the local community.	UH IPRC, UH Kewalo, UH HCRI, DLNR DAR, Sharkastics, MOCMI, PWF, HPU, NIST, NOAA MDP
1.1.9 Educate the public about the commercial fishing industry as part of outreach and education efforts.	KHF, SCH
1.1.10 Participate in international symposiums to highlight the relevance of marine debris in Hawai’i.	MOCMI, HPU, NIST
1.1.11 Increase the number of signs of the fisherman’s code of conduct posted and distributed.	WPRFMC

Future Actions

- Continue internal education among the HI-MDAP partners through workshops on the following topics:
- Solid waste stream in Hawai’i
 - Wastewater
 - Hazardous chemical waste
 - Recycling tours

Strategy 1.2 – Partner with businesses and industry (plastic producers) to support waste reduction efforts

Current/Ongoing Actions

Actions	Organizations
1.2.1 Certify 300 restaurants to be Ocean Friendly .	Surfrider O’ahu, SCH, Sierra Club HI, CCH, Surfrider Maui, Sharkastics, Surfrider Kaua’i
1.2.2 Conduct a campaign for restaurants to accept personal containers for take-out.	Surfrider O’ahu, KHF, SCH, Sierra Club HI, CCH, Pūlama Lāna’i
1.2.3 Continue to reduce/eliminate expanded polystyrene foam use at schools or other institutions.	KHF
1.2.4 Hold an open dialogue with plastic producers and distributors.	NIST, KHF
1.2.5 Offer zero waste/plastic waste reduction assistance for events.	KHF, SCH, HWF
1.2.6 Offer assistance to businesses and hotels to increase plastic-free efforts.	MOCMI, KHF

Strategy 1.2 – Partner with businesses and industry (plastic producers) to support waste reduction efforts

Current/Ongoing Actions

Actions	Organizations
1.2.7 Certify tour operators (e.g., hotels) as ocean friendly businesses.	MOCMI

Future Actions

Implement requirements for event organizers to agree to the reduction of plastic pollution, especially for events near the coastline or streams.

Create policies that establish extended producer responsibility.

Develop biodegradable pellets for air guns (found in birds and on beaches).

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

Current/Ongoing Actions

Actions	Organizations
1.3.1 Continue efforts to reduce the use of single-use plastics, including bags, straws, and expanded polystyrene.	Surfrider O’ahu, SCH, KHF, 808
1.3.2 Track the implementation of the City and County of Honolulu’s National Pollutant Discharge Elimination System . Implement Municipal Separate Storm Sewer System (MS4) water permit trash reduction plan requirements.	USEPA, DOH
1.3.3 Continue efforts to ban expanded polystyrene foam statewide.	Surfrider O’ahu, SCH, KHF, Surfrider Kaua’i, 808, Surfrider Maui, Sharkastics, HWF
1.3.4 Increase statewide collaboration and strategies to integrate source reduction/prevention on updates to the counties’ Integrated Solid Waste Management Plans (ISWMPs) and other plans regarding waste.	KHF

Future Actions

Ensure HI-MDAP is included, by name, in state and county level plans related to marine debris or waste.

Strategy 1.4 – Deploy physical mechanisms to prevent debris

Current/Ongoing Actions

Actions	Organizations
1.4.1 Implement coastal nonpoint source pollution control systems (e.g., agriculture, forestry, marinas, and wetlands) to be appropriated correctly.	OP CZMP, Surfrider O’ahu
1.4.2 Install and evaluate effective technologies to replace the “trash wheel”.	SCH, 808, Surfrider O’ahu, KHF
1.4.3 Build 15 Ocean Friendly Gardens .	Surfrider O’ahu
1.4.4 Advocate for a storm drain retrofit to capture land-based trash before it reaches streams or coastal waters.	DOT

Future Actions

Increase trash and recycling receptacles (with lids) at beach parks throughout the state.

Increase curbside recycling on all islands.

Introduce new bins on Lāna’i that divide trash, compost, and recycling.



Goal 2: Reduce the Amount and Impacts of Ocean-Based Marine Debris

Buoys removed from the Northwestern Hawaiian Islands. (Photo: NOAA)

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

Current/Ongoing Actions

Actions	Organizations
2.1.1 Create inventory of existing at-sea waste management educational materials, identify gaps, and develop new materials as needed.	DLNR DAR, DLNR DOBOR, HWF, KHIB
2.1.2 Continue to conduct marine debris education and outreach, including on waste management, to local fishermen, as well as the Transpac, Pacific Cup, Maui Victoria, and Single Handed Transpac yacht races.	TPMDS, KHIB
2.1.3 Expand Ocean Awareness Training to other islands and partnerships.	NOAA HIHWNMS
2.1.4 Continue to support mandatory boater education and promote boater hurricane and tsunami preparedness.	DLNR DOBOR
2.1.5 Continue education and outreach to fisherman related to derelict fishing gear, other marine debris, and port reception facilities. Print instructional brochures in languages commonly spoken by Hawai'i longline fleet.	WPRFMC, MOCMI, NOAA MDP
2.1.6 Educate consumers on the real price of tuna, including negative externalities.	KHF, SCH

Future Actions

Gather information and create (or find) best management practices (BMPs) on proper and legal waste management at sea.

Identify avenues for raising awareness of BMPs for ocean users within and beyond state and federal jurisdictions.

Continue internal education among HI-MDAP partners through workshops on the following topics:

- Existing North Pacific fisheries
- North Pacific fisheries laws and enforcement
- How fisheries are losing their gear

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

Current/Ongoing Actions

Actions	Organizations
2.2.1 Report adequacy of port reception facilities and general user compliance with MARPOL V regulations.	USCG
2.2.2 Coordinate the placement and transport of reception bins statewide for hard plastics.	SCH, DLNR DOBOR, Sharkastics
2.2.3 Continue to support and partner in the Hawai'i Nets-to-Energy program , including the Pier 38 port reception bin and program.	Schnitzer Steel, Covanta Energy, POP, WPRFMC, NOAA ESD, HLA, UFA, Matson, DOT, UH SG, Surfrider Kaua'i, HWF, KHIB, NOAA MDP
2.2.4 Support tour and fishing boats bringing nets ashore by picking up gear at the dock soon after arrival.	Surfrider Kaua'i
2.2.5 Research and install marine debris reception bins at new locations throughout the state.	DLNR DOBOR, Maui County, HWF, Surfrider Kaua'i, Pūlama Lāna'i, Sharkastics, NOAA MDP
2.2.6 Develop partnerships to create products (e.g., surfboards, skateboards) with salvaged marine debris.	Sharkastics

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

Current/Ongoing Actions

Actions	Organizations
2.3.1 Establish formal partners for an at-sea monitoring program.	UH IPRC, NOAA MDP
2.3.2 Determine best management practices in regards to coastline fishing gear and practices.	MOCMI

Future Actions

Learn more about smart fish aggregating devices. Analyze the devices' impacts and develop ways to identify the source fishery or vessel.

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

Current/Ongoing Actions

Actions	Organizations
2.4.1 Refresh communication with the cruise ship industry.	Maui County, HOST
2.4.2 Identify fishing, maritime, shipping, and tourism industry partners that are engaged in reducing marine debris.	HOST
2.4.3 Participate and engage with IUCN Oceania and Pacific Island regional marine debris partners. Develop Pacific-wide partnerships.	Maui County, HWF, KHIB, NIST through PICES

Future Actions

Collaborate with international fisheries to reduce ocean-based marine debris.

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

Current/Ongoing Actions

Actions	Organizations
2.5.1 Continue enforcement against illegal fishing gear (e.g., fish aggregating devices, gill nets, etc.).	DLNR DOCARE, NOAA OLE
2.5.2 Coordinate a meeting on monitoring/training against illegal discharge at sea.	USCG, DLNR
2.5.3 Continue to support legislation on reducing ocean dumping.	SCH



Goal 3: Support and Sustain Marine Debris Removal

NOAA divers remove a massive net accumulation. (Photo: NOAA Fisheries/Ariel Halperin)

Strategy 3.1 – Utilize effective methods to locate marine debris accumulations

Current/Ongoing Actions

Actions	Organizations
3.1.1 Continue to support the advancement of at-sea detection for marine debris through remote sensing.	NOAA ESD, NOAA MDP
3.1.2 Work with partners to assist in marine debris detection across the Hawaiian Islands.	NOAA MDP, NOAA PMNM, UH HCRI, DLNR
3.1.3 Continue monitoring efforts in the Northwestern Hawaiian Islands to identify accumulation sites and quantify biological impacts.	USFWS, NOAA HMSR
3.1.4 Partner with NOAA UAS program and UH UAS program for continued development of UAS platforms for in-land, coastal, and at-sea detection.	UH UAS, NOAA ESD, NOAA MDP
3.1.5 Continue to work with yacht sailors on at-sea visual surveys for large floating marine debris in the North Pacific.	TPMDS
3.1.6 Design marine debris observing systems.	UH IPRC

Future Actions

Conduct annual aerial shoreline surveys.

Strategy 3.2 – Coordinate effective systems for reporting marine debris

Current/Ongoing Actions

Actions	Organizations
3.2.1 Continue to coordinate with partners to report marine debris through the DLNR Marine Debris Report Form and hotline, (808) 587-0405.	DLNR DOBOR, NOAA MDP, 808, PWF
3.2.2 Maintain and promote marine debris hotlines utilized by the non-governmental organization community.	HWF, Surfrider O’ahu, Surfrider Kaua’i, 808
3.2.3 Identify and implement a standardized monitoring protocol for community-based removal efforts on each island.	NOAA MDP, MOCMI, PWF, NIST, Sharkastics

Strategy 3.3 – Use available information to prioritize cleanup sites

Current/Ongoing Actions

Actions	Organizations
3.3.1 Continue to identify and prioritize cleanup sites and debris types on each island.	Pūlama Lāna’i, KIRC, Surfrider Kaua’i, HWF, Sharkastics, SCH, Surfrider O’ahu, 808, MOCMI, PWF
3.3.2 Continue engagement with NOAA/USFWS marine wildlife representatives regarding their high-priority regions/seasons by island.	HWF, NOAA MDP, UH HCRI, Sharkastics, MOCMI

Strategy 3.4 – Develop capacity for marine debris removal and disposal

Current/Ongoing Actions

Actions	Organizations
3.4.1 Create and update island-specific flow charts depicting the marine debris disposal process.	NOAA MDP, DLNR, SCH, UH HCRI, Sharkastics
3.4.2 Support the development of repurposing and recycling efforts of marine debris across all islands.	NOAA HMSRP, SCH, NOAA ESD, USFWS, DLNR, Sharkastics
3.4.3 Design/build net collection bins and place them at harbors statewide.	HWF, Pūlama Lāna’i, WPRFMC
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.	SCH, Surfrider Kaua’i, 808, Sharkastics, KHF, HWF
3.4.5 Bring and implement ByFusion technology to Kaua’i.	Surfrider Kaua’i
3.4.6 Continue to pursue marine debris collection bins at convenience centers and transfer stations.	808

Strategy 3.4 – Develop capacity for marine debris removal and disposal

Current/Ongoing Actions

Actions	Organizations
3.4.7 Install fishing line recycling bins/containers at recreational harbors statewide.	DLNR DAR, DLNR DOBOR, MOCMI, KHIB, NOAA MDP
3.4.8 Develop a task force on each island to respond to derelict net masses.	808, Sharkastics
3.4.9 Continuously reevaluate a preferred marine debris disposal hierarchy within the state as informed by research.	HWF

Future Actions

Conduct meetings with state and county partners to investigate opportunities to build removal capacity.

Identify community liaisons in each county’s Department of Parks and Recreation (liaisons coordinate beach and park cleanups, and track cleanup and volunteer data and cleanup information).

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

Current/Ongoing Actions

Actions	Organizations
3.5.1 Promote and educate HI-MDAP partners on the Pacific Islands Collaboration Portal .	NOAA MDP
3.5.2 Gather and disseminate statewide cleanup information to better coordinate removal efforts.	808 through HECC, KHIB
3.5.3 Continue to reach out to partners and entities around the North Pacific for communication and collaboration.	HWF, KHIB, OC
3.5.4 Provide financial and logistic support for large-scale marine debris removal in the Northwestern and main Hawaiian Islands.	NOAA PMNM, NOAA ESD, NOAA DARRP, USFWS, NOAA HMSRP, NOAA MDP
3.5.5 Continue to facilitate, coordinate, and conduct regularly scheduled coastal and stream cleanups, net patrols, and alien and invasive species reporting.	HWF, Surfrider Kaua’i, Surfrider O’ahu, Surfrider Maui, SCH,KHF, 808, Sharkastics, Maui County, DLNR DAR, DLNR DOBOR, KIRC, MLC, MOCMI, KHIB

Future Actions

Develop new collaborations with partners and create a list of recycling and disposal options.

Promote the use of the marine debris OpenChannels [listserv](#).



Goal 4: Increase Capacity to Address Abandoned and Derelict Vessels (ADVs)

Abandoned boat on Kure Atoll. (Photo: Naomi Worcester, DLNR/DOFAW)

Strategy 4.1 – Prevention and identification of ADVs

Current/Ongoing Actions

Actions	Organizations
4.1.1 Suggest draft legislation to apply mandatory insurance to all vessels required to be registered with the state or documented by the USCG.	DLNR DOBOR

Future Actions

Set up capacity to properly dispose of old vessels.

Develop a derelict vessel tracking and notification protocol to prevent groundings within the U.S. exclusive economic zone.

Strategy 4.2 – Effectively respond to ADVs

Current/Ongoing Actions

Actions	Organizations
4.2.1 Appoint or designate a DLNR marine debris coordinator.	DLNR DAR

Strategy 4.2 – Effectively respond to ADVs

Current/Ongoing Actions

Actions	Organizations
4.2.2 Revisit discussions to establish a memorandum of understanding or standard operating procedure with USCG for a more collaborative approach to address ADVs at sea.	DLNR DOBOR, NOAA SRC
4.2.3 Make disposal options for ADVs publicly available.	DLNR DOBOR
4.2.4 Enhance interagency coordination for addressing ADVs and maintain an ADV inventory for remote or difficult to access coastlines.	DLNR DOBOR, NOAA SRC, USCG, NOAA MDP
4.2.5 Create, identify, and maintain an ADV situational response contact list.	DLNR DOBOR, USCG, NOAA MDP

Strategy 4.3 – Develop sustainable funding mechanisms and resources for vessel removal and disposal

Current/Ongoing Actions

Actions	Organizations
4.3.1 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
4.3.2 Identify ADV projects or needs viable for USEPA Supplemental Environmental Projects.	NOAA SRC, USEPA
4.3.3 Collaborate with DLNR to use the Oil Pollution Act settlement funds to address ADVs.	NOAA SRC, DLNR DOBOR



Goal 5: Conduct High Quality Research to Understand Marine Debris

NOAA Pacific Island Fisheries Science Center marine debris removal team members catalog marine debris. (Photo: NOAA)

Strategy 5.1 – Develop an understanding of marine debris physical and chemical traits, life cycle, transport, quantity, impacts, and accumulation rate

Current/Ongoing Actions

Actions	Organizations
5.1.1 Identify and support marine debris research priorities through a consultative workshop to facilitate island-specific collaboration.	NIST, HPU, Sharkastics, NOAA MDP
5.1.2 Assess research capacity of state-based organizations and identify gaps in capacity.	UH HCRI, HPU
5.1.3 Explore funding opportunities for research.	NOAA MDP
5.1.4 Conduct monthly NOAA accumulation and/or standing stock shoreline surveys.	Pūlama Lāna‘i, KIRC, PWF, NOAA MDP
5.1.5 Continue to model and forecast marine debris from the 2011 tsunami in Japan and other sources in the Pacific Ocean.	UH IPRC

Future Actions

Seek multi-stakeholder/interdisciplinary consultation for research topics through a centralized forum.

Maintain a compilation of Hawai‘i-based marine debris research publications.

Strategy 5.2 – Develop or identify standardized methods or BMPs for applicable aspects of research to ensure data/projects can be meaningfully analyzed

Current/Ongoing Actions

Actions	Organizations
5.2.1 Continue to support and promote NOAA MDP standardized shoreline monitoring protocols throughout Hawai'i.	NOAA MDP, PWF
5.2.2 Develop standardized laboratory methods.	NIST

Strategy 5.3 – Enhance and advance research on ecological impacts of marine debris

Current/Ongoing Actions

Actions	Organizations
5.3.1 Identify invasive species found on marine debris.	DLNR DAR
5.3.2 Continue marine debris and plastic accumulation research in biota.	PWF, NIST, HPU
5.3.3 Continue to assess the impacts of marine debris on wildlife.	MOCMI, PWF, Sharkastics, HPU, NIST

Strategy 5.4 – Improve research on the economic impacts of marine debris

Current/Ongoing Actions

Actions	Organizations
5.4.1 Identify the economic impacts of plastic reduction policies, such as an expanded polystyrene foam ban.	Sharkastics, Swell Consulting

Future Actions

Identify the economic impacts of marine debris to Hawai'i's tourism industry, local businesses, municipalities, and residents.

Strategy 5.5 – Evaluate the effectiveness of mitigation, outreach, and removal efforts of marine debris

Current/Ongoing Actions

Actions	Organizations
5.5.1 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.	UH HCRI, PWF

Strategy 5.6 – Support communication and collaboration of research to all stakeholders

Current/Ongoing Actions

Actions	Organizations
5.6.1 Improve collaboration and data sharing through the publishing, compiling, and sharing of recent scientific findings.	UH HCRI, DLNR DAR, PWF, HPU, NIST, Sharkastics
5.6.2 Leverage, implement, and transfer knowledge of the marine debris strategy within the Lānaʻi Natural Resources Management Plan.	Pūlama Lānaʻi
5.6.3 Continue compiling and make publicly accessible the feasibility of establishing a marine debris foundation for Hawaiʻi.	HI-MDAP researchers
5.6.4 Compile data from various cleanup organizations.	UH HCRI, 808, PWF, NIST
5.6.5 Collaborate with international marine debris partners.	KHF, SCH, KHIB, HWF, MOCMI, PWF, HPU, NIST, Surfrider Kauaʻi

Appendix I: 2016-2018 HI-MDAP Accomplishments

Goal 1: Reduce Sources of Marine Debris through Prevention

Strategy 1.1 - Change consumer behavior through outreach and education

Actions

Use social media as a platform for outreach to the general public. Utilize #HImarinebris to capture work being done by partners.

- Collectively, all organizations utilized social media for education and outreach to the general public. #HImarinebris was used in over 1,500 Instagram posts. (KHF, SCH, Surfrider O’ahu, Surfrider Kaua’i, 808, Sharkastics, HWF, NOAA MDP).

Increase invited speaking engagements (e.g., panels, speakers at events, etc.).

- **NOAA MDP** - Successfully invited congressional member, Senator Brian Schatz, to attend the Northwestern Hawaiian Islands marine debris event on April 13, 2017 in collaboration with other funding organizations. Also in attendance were in-district staff members from Congresswomen Mazie Hirono’s and Colleen Hanabusa’s offices.
- **PWF** - Held screening of the documentary “A Plastic Ocean” for 200+ participants and hosted a panel discussion with state, federal, and non-profit experts after the film.
- **Surfrider O’ahu** - Hosted the AECOM quarterly meeting and gave two presentations at the state’s Department of Transportation (Harbors Program).

Create five plastic-free schools (i.e., no single-use plastics in cafeteria).

- **KHF** - Established [Plastic Free Schools](#), including Le Jardin Academy, St. Anthony’s, ‘Iolani School, Punahou School, and Kaiser High School. Starting in the Fall 2018/Spring 2019, the Department of Education will not include foam in bid lists, so all schools will use paper or another non-foam alternative!
- **UH Hilo** - The Sustainability Committee worked with Sodexo to reduce the use of plastics in the cafeteria and replace them with compostable packaging. Sorting stations (6+) have been put on campus to encourage recycling.
- **UH Hilo** - The Students of Sustainability organization promoted zero waste events on campus and put on workshops in dorms and elsewhere to promote waste source reduction and recycling.

Create a pre- and post-survey or other test (choice of single-use vs. re-useable item) to track behavior change before and after beach cleanups.

- **HWF** - Made the Keiki pre- and post-[assessment](#) related to marine debris prevention curriculum available online (designed for K-5th grade).

Create a pre- and post-survey or other test (choice of single-use vs. re-useable item) to track behavior change before and after beach cleanups.

- **Surfrider O'ahu** - Continued to empower the community through the Civics IS Sexy program in collaboration with KHF and partners.
- **Surfrider Kaua'i** - Provided a tour and presentation of marine debris processing center on July 9, 2018 for all major County Council candidates.

Strategy 1.1 - Change consumer behavior through outreach and education

Actions

Continue general outreach at schools and universities (includes outreach on specific items, such as single-use plastics, cigarette butts, and water bottles).

- Collectively, these organizations reached over 15,000 students (HWF, Surfrider O'ahu, Surfrider Kaua'i, SCH, NOAA MDP, NOAA CREP, KHF, UH).
- **NKK** - Introduced an elementary school safety/conservation program statewide in collaboration with the Department of Education.
- **UH Hilo** - Offered an undergraduate course, Marine Debris in the Pacific (MARE 410), in Spring 2017 and Fall 2018 semesters.

Continue general outreach at schools and universities (includes outreach on specific items, such as single-use plastics, cigarette butts, and water bottles).

- **PWF** - Conducted marine debris awareness activities at Girl Scouts STEM Camp on Maui. Additionally, raised awareness on the impacts of marine debris with a focus on cigarette butts at three outreach stations on Maui and all PacWhale eco-tours from Aug 2016 - Jan 2018 (funded through NOAA MDP). Lastly, launched a Last Straw campaign in April 2018 to encourage the use of reusable straws, which are available in PWF stores and on PWF vessels. Currently working with 10 Maui restaurants to promote this initiative.
- **HWF** - Over 150 foam free restaurants and food vendors recorded on Hawai'i Island. Set up outreach booths at over a dozen events on two islands, and gave three presentations at UH Hilo.
- **Sharkastics** - Hosted a screening of the documentary, "Albatross". Tabled at five 4th Friday Kihei Community Party events and various local ocean conservation events.
- **UH Hilo** - Sustainability Committee highlight was the annual Earth Day Fair, a zero waste event attended by 2,000+ K-12 kids plus the broader university community that included outreach, activities, and lectures about reducing waste, reducing plastic waste, and recycling.
- **UH IPRC** - Participated in School of Ocean and Earth Science and Technology Open House attended by over 6,000 students and the general public.
- **KHIB** - Created a public service announcement for monofilament fishing line recycling to be presented to local fishing clubs. Currently working on creating behavior change towards recycling.
- **Zero Waste O'ahu** - Hosted a zero waste summit attended by 300+ participants on July 14, 2018 at SALT Kaka'ako.
- **NOAA MDP** - Conducted outreach on marine debris prevention at 32 events with approximately 5,180 individuals engaged.

Relay scientific information to the community.

- **808** - Presented 808 & Surfrider Kaua'i cleanup data at the Sixth International Marine Debris Conference (6IMDC) poster session.
- **PWF** - Presented research findings on debris accumulation in nearshore waters of Maui and impacts of debris on cetacean species at the 6IMDC. Shared marine debris research findings at the Kohola Brewery Science Night. Conducted an interview with GSU TV (PBS) on current marine debris research.
- **Sharkastics** - Presented Ka'ehu Cleanup data (poster) plus Maui, Lāna'i, and Moloka'i data (co-poster) at the 6IMDC.
- **Oikonos** - Shared data on seabird plastic ingestion via the "Winged Ambassadors" lessons and activities.
- **HWF** - Presented 15 years of debris removal data to the general public at the Kahuku unit of the national park.
- **NOAA MDP** - Research and Communications team hosted a Reddit [Ask Me Anything](#) on microplastics.

Strategy 1.2 - Promote and encourage extended producer responsibility

Actions

Certify 300 restaurants to be [Ocean Friendly](#).

- **Surfrider O'ahu** - Certified 165 restaurants as of February 2018. Implemented new requirements (platinum certification) not just on foam and plastics, but including energy savings, water use/savings, following the model of [Seafood Watch](#) and sustainable fishing.
- **Surfrider Kaua'i** - Certified 14 restaurants on Kaua'i.
- **MHF** - Certified 35 restaurants as of August 2018.

Institute more expanded polystyrene bans at higher learning institutions.

- **KHF** - A Kamehameha Schools Maui Campus student began discussions with statewide administrators regarding a polystyrene ban. This student is currently working with MHF to create environmental videos on plastics issues. Additionally, statewide legislation is being pursued in two forms, an all-out to-go container ban and a ban for state-run organizations buying and using expanded polystyrene.

Strategy 1.3 - Enhance efforts to create and enforce laws reducing solid waste

Actions

Close plastic bag ban loophole.

- **808** - Shared the campaigns on social media with our followers and gave them updates.

Complete expanded polystyrene ban.

- Collectively, organizations provided testimony in support for county-level bans on Maui and Hawai'i Island (Surfrider O'ahu, SCH, KHF, Surfrider Kaua'i, 808, Surfrider Maui, Sharkastics, HWF).
- County-level bans take place:
 - Maui County - December 31, 2018
 - Hawai'i County - July 1, 2019
- A statewide ban had passed the Senate and is now waiting on House hearing assignments, HB2107 (February 2018).

Strategy 1.4 - Deploy physical mechanisms to prevent debris

Actions

Install and evaluate the effectiveness of a "trash wheel" to remove land-based debris in the Ala Wai.

- Collaboratively, all organizations helped to complete a feasibility study. Currently, they are seeking funding opportunities and permits from Army Corps of Engineers (SCH, 808, Surfrider O'ahu, KHF).
- **SCH** - Seabin technology to arrive in February 2019.

Build 12-15 [Ocean Friendly Gardens](#).

- **Surfrider O'ahu** - Seven Ocean Friendly Gardens built.
- **Surfrider Kaua'i** - 15 Ocean Friendly Gardens certified.

Goal 2: Reduce the Amount and Impacts of Ocean-Based Marine Debris

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

Actions

Conduct general education and outreach with local fishermen.

- **808** - Began selling salvageable fishing gear (lures, lead weights, sinkers, hooks, etc.) collected from cleanups and sold them back to fisherman at a discounted rate. Profit to date: \$83.00.
- **Surfrider Kaua'i** - Provided cash prizes at a local fishing contest for the most marine debris hauled off the reef by participants.
- **HWF** - Collaborated for Kona's first ever "Scoop-it-up" cleanup event where fishers launched from Honokōhau Harbor (April 2018) with Big Island Waveriders Against Drugs and Surfrider Kona.
- **DLNR DAR** - Continued efforts at many outreach events statewide by the barbless hook team and outreach specialists.

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

Actions

Continue to support and partner in the Hawai'i Nets-to-Energy program. Includes supporting Pier 38 port reception bin and program.

- **NOAA MDP** - Helped to acquire a new 30-cubic yard roll-off reception bin for Pier 38 and continued to coordinate with partners on proper communication and drop-off protocols.
- **Surfrider Kaua'i** - Sent six shipping containers of nets to H-Power through Matson's Ka Ipu 'Āina Program.
- **HWF** - Sent two shipping containers totaling 39,137 lbs of derelict fishing gear to H-Power through Matson's Ka Ipu 'Āina Program.

Support tour and fishing boats bringing nets ashore by picking up gear at the dock soon after arrival.

- **Surfrider Kaua'i** - Three tour boat companies removed nets and continue to remove nets at-sea and work with Surfrider Kaua'i for hauling logistics.
- **HWF** - Continued efforts to work with Honokōhau Harbor and various boaters. DLNR DOBOR is also helping to transport large net bundles left at harbors (and washing up on our shoreline) to the net receptacle site outside the DLNR DAR office.

Research potential locations for marine debris storage at ports/harbors on Maui (Kahului), Hawai'i Island (Honokōhau), and Lāna'i.

- **HWF** - Established a net bin at Honokōhau Harbor (Kona) and Hilo Bayfront outside local DLNR DAR offices.
- **NOAA MDP** - Purchased and helped to establish a marine debris reception bin at the James Campbell National Wildlife Refuge.

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

Actions

Learn more about smart fish aggregating devices; analyze impacts.

- **HWF and DLNR DAR** - Collected two smart fish aggregating devices and arranged shipment to IPRC and NOAA MDP researchers on O’ahu in August 2018.

Establish formal partners for at-sea monitoring program.

- **NOAA MDP** - Continued to work with NOAA Observer Program for at-sea detection through Hawai’i Longline Fishery by utilizing Marine Debris Encounter Reports. Data collected is from 2007 - present.

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

Actions

Participate and engage with IUCN Oceania and Pacific Island regional marine debris partners; develop Pacific-wide partnerships.

- **Surfrider Kaua’i** - Joined GGGI.
- **HWF** - Coordinated and communicated with World Ocean Collective members (Gulf of Alaska Keeper, Japan Environmental Action Network (JEAN), Washington CoastSavers, SOLVE Oregon, Oceans International, IPRC, Vancouver Aquarium, OSEAN Korea, Society of Wilderness - Taiwan, 5 Gyres, Kōkua Hawaii Foundation), and researched official membership options with GGGI.

Goal 3: Support and Sustain Marine Debris Removal

Strategy 3.1 - Utilize effective methods to locate marine debris accumulations

Actions

Continue to support opportunistically the advancement of at-sea detection for marine debris through remote sensing.

- **NOAA MDP** - Hosted a remote sensing and detection session at the 6IMDC. Worked with NOAA NESDIS to acquire and analyze imagery of the Northwestern Hawaiian Islands to help increase efficiency of 2018 removal efforts.

Work with partners to assist in marine debris detection across the State of Hawaii.

- **NOAA MDP** - Continued to work with NOAA Observer Program for at-sea detection through Hawai'i Longline Fishery by utilizing Marine Debris Encounter Reports.

Partner with NOAA-UAS Program for continued development of UAS platforms for at sea detection.

- **NOAA MDP** - Alaska Regional Coordinator attended a NOAA UAS meeting hosted in California to determine progress made toward the effective detection and identification of marine debris at-sea.

Continue to work with yacht sailors on at-sea visual surveys for floating marine debris in the North Pacific (PRA-approved data collection form).

- **HWF and TPMDS** - Collaboratively identified students to help with data entry and quality control of backlogged data.

Strategy 3.2 - Coordinate effective systems for reporting marine debris

Actions

Maintain and promote a marine debris "hotline."

- Collectively, all organizations continued to monitor their associated hotlines and social media platforms (HWF, Surfrider O'ahu, Surfrider Kaua'i, 808).

Use the O'ahu Marine Debris Response and Removal reporting form.

- **DLNR DOBOR** - Created a [Marine Debris Report Form](#). All partners have been promoting the form as the main platform for marine debris reporting.

Partner with organizations to implement standardized shoreline monitoring and data collection in order to build a baseline for various locations throughout the State.

- **PWF** - Partnered with the NOAA MDP and National Marine Sanctuaries Foundation to conduct monthly monitoring of three shoreline sites on Maui in 2018. Data for these sites dates back to 2013.
- **PWF** - Partnered with NIST to analyze polymer composition of plastics collected from systematic at-sea sampling of floating plastics.
- **HWF, Pūlama Lāna'i, Sharkastics, and Keep Puakō Beautiful** - Continued to conduct accumulation surveys.
- **NOAA MDP** - Continued to host NOAA Marine Debris Monitoring and Assessment Project training for interested organizations.

Continue to coordinate with partners to report marine debris to disasterdebris@noaa.gov, dlnr.marinedebris@Hawaii.gov, and (808)587-0405.

- Organizations continued to report large and unusual disaster debris to NOAA, DLNR, and UH IPRC (marinedebris@soest.hawaii.edu).
- **NOAA MDP** - Continued to submit potential Japan tsunami marine debris items for tracing and confirmation through the Consulate of Japan. 36 items have been confirmed in Hawai'i.

Strategy 3.3 - Use available information to prioritize cleanup sites

Actions

Removal and Research Huis prioritize cleanup sites.

- Most organizations are guided by volunteer reports for cleanup prioritization (Pūlama Lāna'i, KIRC, Surfrider Kaua'i, HWF, Sharkastics, SCH, Surfrider O'ahu, 808).
- **Sharkastics** - Continued to host Ka'ehu cleanups on the fourth Sunday of every month and conduct other beach and reef cleanups as needs arise.

Contact appropriate NOAA/USFWS marine wildlife representatives regarding their high-priority regions/seasons by island.

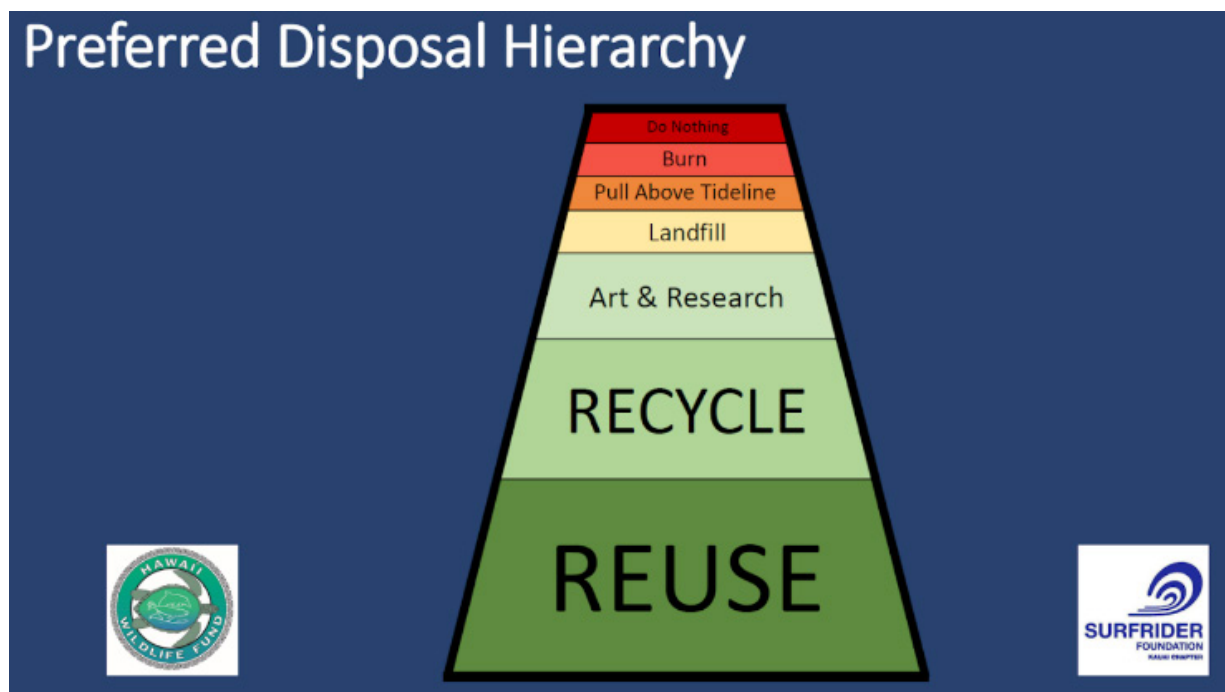
- **NOAA MDP** - Participated in consultative meetings with the NOAA Fisheries Pacific Islands Fisheries Science Center Protected Species Division to acquire monk seal and sea turtle stranding data to identify potential overlapping marine debris accumulation and entanglement hot spots.

Strategy 3.4 - Develop capacity for marine debris removal and disposal

Actions

Build a flow chart about methods of marine debris disposal.

- **HWF and Surfrider Kaua'i** - Identified a preferred disposal hierarchy and presented this schematic at the 6IMDC event:



Strategy 3.4 - Develop capacity for marine debris removal and disposal

Actions

Support recycling efforts of Northwestern Hawaiian Islands debris.

- **SCH** - Continued to maintain drop-off sites for hard/rigid ocean plastics at Turtle Bay and Kailua Surfboards and Kayaks.

Design/build net collection bins and place them at harbors on the Big Island and Lānaʻi.

- **HWF** - Continued management of a net drop-off bin at Honokōhau Harbor (located outside of DLNR DAR Kona office) and another bin outside DLNR DAR Hilo - Wailoa Fisheries Station.
- **Surfrider Kauaʻi** - Received approval to place a bin at Port Allen Harbor (near tour boat dock) for net drop-off.

Encourage use of sustainable/reusable options during cleanups through partnerships with stables, breweries, coffee companies.

- **808** - Promote World Centric brand products.
- **PWF** - PacWhale eco-tours has partnered with Sustainable Products Hawaii to supply all of PacWhale's vessels and events with sustainable products. Additionally, PacWhale partnered with Maui Brew Company to supply used grain bags for citizen science coastal marine debris removal and monitoring program.
- **HWF** - All cleanup bags are sourced from local farmers or only multi-use bags (such as UV-resistant Super Sack bulk bags) are purchased. Only reusable gloves are provided and volunteers are encouraged to BYO-bottles (HWF provides water refills) to events.

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

Actions

Hold and participate in Hui quarterly calls, coordination calls, and webinars to share innovative marine debris removal technology, tools, general supplies, and recommendations.

- **NOAA MDP** - Hosted 19 Hui calls in conjunction with volunteer Hui Coordinators. Hosted one coordination call on July 11, 2017. Highlighted innovative removal projects and best management practices including the Northwestern Hawaiian Islands in-water efforts.

Develop new collaborations with partners in the main Hawaiian Islands for recycling and disposal options.

- **HWF** - Developed an ongoing relationship with Terracycle and Sand Cloud.

Create marine debris listserv.

- Organizations have determined that the [MarineDebris.Info](#) listserv should be followed and promoted.

Create data portal.

- **NOAA MDP** - Created a [Pacific Islands Marine Debris Collaborative](#) portal.

Lead communication between Oʻahu marine debris stakeholders doing cleanups.

- **808** - Through HECC, communication and collaboration between groups have never been stronger.

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

Actions

Continue to reach out to partners and entities around the North Pacific for communication and collaboration.

- **HWF** - Continued to maintain relationships with partners across the Pacific (World Ocean Collective - see Strategy 2.4.3).

International Coastal Cleanup event, "Get the Drift and Bag It."

- **PWF** - Collaborated with Mālama Maui Nui for this event on Maui.

Continue improved partner communication through HI-MDAP quarterlies, leading bi-annual calls, and creating Huis to have more focused discussions.

- **NOAA MDP** - Helped create four Hui's (Prevention, Removal, Research, and ADV). Rolled out five HI-MDAP quarterly newsletters.

Provide financial and logistic support for large-scale marine debris removal in the Northwestern Hawaiian Islands.

- **NOAA MDP** - Hosted quarterly internal meetings with NOAA funding partners. Supported the transport of approximately 100,000 lbs of derelict fishing gear and plastic from Midway and Kure Atoll (April 2017).
- **NOAA MDP and NOAA DARRP** - Provided fiscal year 2017 and 2018 funding to support a large-scale effort in Sept - Oct 2018.

Continue to facilitate, coordinate, and conduct regularly scheduled coastal and stream cleanups, net patrols, and AIS reporting.

- **808** - In 2016 and 2017, hosted and supported 1,628 and 1,593 volunteer cleanups, respectively.
- **PWF** - In 2017, PWF's citizen science coastal marine debris monitoring program resulted in the cleaning of 130 of Maui's beaches and quantification of 20,353 pieces of debris with 138 beaches cleaned in 2018 so far, documenting 22,515 items of debris.
- **Sharkastics** - Continued to host Ka'ehu Cleanups on the fourth Sunday of every month, plus conduct other beach and reef cleanups as needs arise.
- **SCH** - As of February 2018, continued large scale cleanups across the state. In 2017, engaged with approximately 12,000 students.
- **Surfrider Kaua'i** - Conducted weekly cleanups/[Net Patrols](#) and bi-monthly beach cleanups around the island of Kaua'i.
- **HWF** - Coordinated over 90 debris removal activities with greater than 12,500 documented volunteer hours that resulted in the removal of 105,529 lbs (42% nets) from Hawai'i Island and 14 cleanups with more than 1,800 volunteer hours and the removal of 11,747 lbs (25% nets) from Maui over this reporting period (Aug 15, 2016 to Aug 15, 2018).

Goal 4: Increase Capacity to Address Abandoned and Derelict Vessels (ADV)

Strategy 4.1 - Prevention of ADVs

Actions

Suggest draft legislation to apply mandatory insurance to all recreational watercraft.

- **DLNR DOBOR** - Lobbied legislators to determine their level of support.

Strategy 4.2 - Effectively respond to ADVs

Actions

Appoint or designate DLNR marine debris coordinator.

- **DLNR DOBOR** - Clifford Inn has temporarily taken on point-of-contact responsibilities.

Create and maintain ADV inventory for coastline and nearshore waters.

- **NOAA MDP, USCG, and DLNR DOBOR** - Identified ADVs in the main Hawaiian Islands (51) through UH HCRI aerial survey analysis. Working with USCG to find a C130 flight to ground truth and/or identify new ADVs.

Investigate disposal options for ADVs and disseminate info upon request.

- **DLNR DOBOR** - Confirmed that disposal options depend on hull type. Currently, H-power (for O'ahu only) will take fiberglass hulls only if cut into three foot sections.

Continue interagency coordination for addressing ADVs.

- **NOAA MDP** - Hosted and coordinated ADV Hui calls. Coordinated with the Consulate of Japan to formulate an official letter releasing custody of any potential Japan tsunami marine debris to DLNR following 6-month grace period.
- **USCG** - Continued to respond to grounded vessel reports and relay information to ADV Hui.

Strategy 4.3 - Develop sustainable funding mechanisms and resources for vessel removal and disposal

Actions

Establish abatement fund.

- **DLNR DOBOR** - DLNR is looking to introduce legislation to establish an abatement fund and mandatory insurance bill (including trailering boats) and potentially adding a disposal fee when vessels are titled or transferred/registered for the first time. Hawaii is now a Title State.

Propose rule/amendment to charge a disposal fee at time of vessel transfer or first time registration.

- **DLNR DOBOR** - Engaged with DOBOR legal fellow to pursue. The focus has been on a large rule package including various topics.

Goal 5: Conduct High Quality Research to Understand Marine Debris

Strategy 5.1 – Develop understanding of marine debris physical and chemical traits, life cycle, transport, quantity, impacts, and accumulation rate of marine debris

Actions

Identify marine debris research priorities through a consultative workshop.

- **NOAA MDP** - Hosted a research workshop on March 30, 2017 to help identify priorities, resources, and gaps within the Hawai'i research community. The proceedings of the workshop are now available.

Assess research capacity for state-based organizations and identify gaps.

- **808, UH HCRI, SCH, and KHF** - Uploaded data from 2005-present to the Tangoroa Blue Foundation (Australia Marine Debris Initiative) database that will act as a clearinghouse for Hawai'i data. Funding was provided through a Castle Foundation grant to 808 that helped create the HECC.
- **PWF** - Continued surveys at four locations on windward Maui since 2013 in conjunction with odontocetes (toothed whales) surveys to see their proximity as a risk with marine debris.
- **HPU** - Continued study of marine plastics in stomach contents of various seabirds on main Hawaiian Islands and Northwestern Hawaiian Islands. Students are conducting projects on marine plastics within the bolus program. Graduated a master's student that assessed the polymer identification of ingested debris in pelagic Pacific sea turtles.
- **NOAA MDP** - Established national research priorities: research that explores the ecological risk associated with marine debris, determines debris exposure levels, and examines the fate and transport of marine debris in nearshore, coastal environments.

Complete literature review on research priorities.

- **HWF** - Compiled literature resources on a shared Google Drive with HI-MDAP Research Workshop participants.
- **NIST** - Published a literature review on the amounts of ingested debris in sea turtles, showing that the Central Pacific is the global hotspot for this problem.

Establish new lines of funding.

- **NOAA MDP** - Offered a fiscal year 2017 Marine Debris Research federal funding opportunity.

Conduct monthly NOAA accumulation and/or standing stock shoreline surveys.

- **PWF** - Conducted NOAA standing stock surveys simultaneously at two sites on Maui from July to December 2017 to compare differences. Conducted daily NOAA accumulation surveys for 90 days pre- and post-outreach campaign at a single site on Maui. Currently, conducting monthly NOAA accumulation surveys at three sites on Maui since 2013.
- **Pūlama Lāna'i** - Established three accumulation sites on the island of Lāna'i.

Continue to model and forecast marine debris from the 2011 Tsunami in Japan and other sources (Pacific Ocean).

- **UH IPRC** - Conducted 5-model comparison estimating lingering debris and its fate and transport. Preliminary results show that approximately 20% of Japan tsunami marine debris vessels are still at sea and 10-20% of these vessels will wash up each year for approximately the next ten years.

Strategy 5.2 – Develop or identify standardized methods or BMPs for applicable aspects of research to ensure data/projects can be meaningfully analyzed

Actions

Continue to support and promote NOAA MDP standardized shoreline monitoring protocols.

- **NOAA MDP** - Conducted three trainings for USFWS Johnston Atoll field team to continue NOAA standing stock surveys. Three accumulation sites were added in West Hawai'i through Keep Puako Beautiful and Hawai'i Preparatory Academy.
- **HWF** - Established a NOAA accumulation site at Kamilo Point in September 2016 and have conducted 18 surveys to date (August 2018).

Strategy 5.3 – Improve research on ecological impacts of marine debris

Actions

Identify invasive species on marine debris.

- **PWF** - Worked with DLNR DAR to identify and sample potential invasive species found on debris collected at sea (three samples shipped for analysis).
- **UH HCRI** - A new article published in Science featured aquatic invasive species on Japan tsunami marine debris; the research included DLNR DAR data.
- **HWF and DLNR DAR** - Continued to send samples of aquatic invasive species attached to potential Japan tsunami marine debris to Dr. Carlson/Williams-Mystic for analysis.

Continue bioplastic accumulation research in seabirds.

- **HPU** - Sampled 20 Hawaiian seabird species and found plastic in 15, including in the previously undocumented brown booby and white-tailed tropic birds. Also sampled 115 predatory fish caught by recreational fishers around O'ahu for plastic and prey, and documented plastic ingestion in five species (ahi, aku, mahi, tombo, kawa), with the highest incidence rates in Albacore Tuna (tombo) 86% and Skipjack Tuna (aku) (40%).
- Pelagicos Lab at HPU is conducting analyses with graduate students on main Hawaiian Islands and Northwestern Hawaiian Islands specimen.
- Hawai'i's Pelagicos and HWF were featured on HBO's VICE on April 7th, 2017 in an episode on ocean plastics.

Strategy 5.4 – Improve research on economic impacts of marine debris

Actions

Identify economic impacts of expanded polystyrene foam ban or other policies.

- **KHF** - Internship started summer of 2018.
- **PWF** - Partnered with NIST to assess the potential impacts of a polystyrene ban on the accumulation of polystyrene plastics on three beaches pre- and post-ban on Maui.

Strategy 5.5 – Evaluate the effectiveness of mitigation, outreach, and removal efforts of marine debris

Actions

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.

- **UH HCRI** - Created a HECC [map](#).
- **PWF** - Conducted a controlled study on the impacts of outreach on marine debris accumulation in partnership with the Grand Wailea and their guests using 90 days (45 pre and 45 post) of daily NOAA accumulation surveys. Conducted NOAA standing stock surveys at beaches with an outreach station and beaches without an outreach station to evaluate the impacts of outreach. Currently working with the NOAA MDP and National Marine Sanctuaries Foundation to assess the efficacy of tobacco-free beaches legislation on cigarette butt accumulation using pre- and post-ban datasets.

Strategy 5.6 – Support communication and collaboration of research to all stakeholders

Actions

Improve collaboration and data sharing through the publishing, compiling, and sharing of high quality peer reviewed papers.

- **PWF** - Submitted a joint manuscript between PWF, NIST, and UH on the: “Nearshore sea surface marine debris in Maui County, Hawai’i: distribution, drivers, and polymer composition”. Published an article on: “Quantifying the risk that marine debris poses to cetaceans in coastal waters of the 4-island region of Maui” in *Marine Pollution Bulletin*.
- **UH HCRI** - Published an article in *Marine Pollution Bulletin Special Issue on Japanese Tsunami Marine Debris*: Moy et al. 2017, “Mapping coastal marine debris using aerial imagery and spatial analysis”.
- **HWF, Surfrider Kaua’i, Sharkastics, and UH Hilo** - Submitted a journal article for publication for the *Marine Pollution Bulletin 6IMDC Special Issue* related to the efficiency of marine debris removal activities.
- **NIST** - Published the following manuscripts:
 - Lynch, J. M. (2018). Quantities of Marine Debris Ingested by Sea Turtles: Global Meta-Analysis Highlights Need for Standardized Data Reporting Methods and Reveals Relative Risk. *Environmental Science & Technology*. doi:10.1021/acs.est.8b02848
 - Jung M.R., Balazs G.H., Work T.M., Jones T.T., Orski S.V., Rodriguez C. V., Beers K.L., Brignac K.C., Hyrenbach K.D., Jensen B.A., & Lynch J.M. (2018). Polymer Identification of Plastic Debris Ingested by Pelagic-phase Sea Turtles in the Central Pacific. *Environmental Science & Technology*. doi:10.1021/acs.est.8b03118
 - Jung M.R., Horgen F.D., Orski S.V., Rodriguez C. V., Beers K.L., Balazs G.H., Jones T.T., Work T.M., Brignac K.C., Royer S-J., Hyrenbach K.D., Jensen B.A., & Lynch J.M. (2018). Validation of ATR FT-IR to identify polymers of plastic marine debris, including those ingested by marine organisms. *Marine Pollution Bulletin*, 127,704-716. doi:10.1016/j.marpolbul.2017.12.061
 - Clukey K.E., Lepczyk C.A., Balazs G.H., Work T.M., Li Q.X., Bachman M.J., & Lynch J.M. (2018). Persistent Organic Pollutants in Fat of Three Species of Pacific Pelagic Longline Caught Sea Turtles: Accumulation in Relation to Ingested Plastic Marine Debris. *Science of The Total Environment*, 610-611:402-411. doi:10.1016/j.scitotenv.2017.07.242

Strategy 5.6 – Support communication and collaboration of research to all stakeholders

Actions

Create forum for non-governmental organizations and researchers.

- **UH HCRI** - Created the Water Guardian Social Network - [Hawaii Marine Debris Network](#).

Establish research listserv and share capabilities.

- Organizations have determined that the [MarineDebris.Info](#) listserv should be followed and promoted.

Investigate feasibility of establishing a marine debris foundation for Hawai'i.

- **NKK** - A Marine Debris Foundation Draft in concept was reviewed by few Research Hui members and key retired players from NMFS, NOAA (not MDP) and USCG, and was introduced at the 6IMDC. Efforts are being made to discuss feasibility within NOAA MDP headquarters. The foundation would serve as a clearinghouse for funding to address marine debris issues.

Compiling of data from various cleanup organizations.

- **808** - Successfully collected data from 10 HECC partners in 2017.

Reach out to international marine debris partners.

- **Surfrider Kaua'i and HWF** - See accomplishments from Strategy 2.4.

Appendix II: 2018 HI-MDAP Participant List

Name	Organization
Bud Antonelis	NKK
Nir Barnea	NOAA MDP
Lauren Blickley	Swell Consulting
Kayla Brignac	HPU
Grazel Caceres	Pūlama Lānaʻi
Nicole Chatterson	UH Office of Sustainability
Steven Colbert	UH Hilo
Stuart Coleman	Surfrider Foundation, Hawaiʻi Chapters
Hayley Cook	Office of Climate Change, Sustainability and Resiliency
Brianna Craig	NOAA Intern
Jens Currie	PWF
Mark Dix	NOAA MDO
James Espaniola	DLNR/DOFAW/NEPM Maui Nui
Peggy Foreman	NOAA PIRO
Justin Goggins	DLNR DAR
Jan Hafner	UH IPRC
Amanda Hayasaka	Covanta Energy
David Hyrenbach	HPU
Jim Howe	Honolulu Emergency Service Department
Clifford Inn	DLNR DOBOR
Clinton Jamile	Department of Parks & Recreation
Melissa Jung	HPU
Kalani Kaʻanāʻanā	HTA
Christy Kehoe	NOAA MDP, Freestone Environmental Services
Cheryl King	Sharkastics
Eric Kingma	WPRFMC
Megan Lamson	HWF
Fawn Liebengood	808
Hank Lynch	The Nature Conservancy

Name	Organization
Jennifer Lynch	NIST
Mark Manuel	NOAA MDP, Freestone Environmental Services
Mia Melamed	NOAA Intern
James Morioka	NOAA ESD
Shanelle Naone	NOAA MDP, Freestone Environmental Services
Thomas Noyes	The Friends of Kamalani and Lydgate Park
Kahi Pacarro	SCH
Rob Parsons	Maui County
Doora Shin	KHF
John Titchen	USCG
Dean Tokishi	KIRC
Kristi West	UH Mānoa Stranding Program
Barbara Wiedner	Surfrider Kaua'i
Chris Woolaway	KHIB & HOST



Wilbur L. Ross, Jr.
United States Secretary of Commerce

RDML Tim Gallaudet, Ph.D., USN Ret.
Assistant Secretary of Commerce for Oceans and Atmosphere and
Acting Under Secretary of Commerce for Oceans and Atmosphere

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

