

HAWAI'I MARINE DEBRIS WORKSHOP

SUMMARY REPORT



NOAA PIFSC CRED



February 20, 2008

ACKNOWLEDGMENTS

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ACRONYMS

BoatU.S.	Boat Owners Association of the United States
BMP	Best management practice
CCH	City and County of Honolulu
CRED	NOAA PIFSC Coral Reef Ecosystem Division
CRON	Coral Reef Outreach Network
CZM	State of Hawai'i, DBEDT, Coastal Zone Management Program
DAR	State of Hawai'i, DLNR, Division of Aquatic Resources
DBEDT	State of Hawai'i, Department of Business, Economic Development, and Tourism
DFG	Derelict fishing gear
DLNR	State of Hawai'i, Department of Land and Natural Resources
DOCARE	State of Hawai'i, DLNR, Division of Conservation and Resources Enforcement
DOH	State of Hawai'i, Department of Health
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
GPS	Global Positioning System
HIHWNMS	Hawaiian Islands Humpback Whale National Marine Sanctuary
HPD	Honolulu Police Department
HPU	Hawai'i Pacific University
HTA	Hawai'i Tourism Authority
HVCB	Hawai'i Visitors and Convention Bureau
ICC	International Coastal Cleanup
IMDCC	Interagency Marine Debris Coordinating Committee
LCDR	Lieutenant Commander
LTJG	Lieutenant, Junior Grade
MDRPA	Marine Debris Research, Prevention and Reduction Act
MHI	Main Hawaiian Islands
NGO	Nongovernmental organization
NIE	Newspapers in Education
NOAA	National Oceanic and Atmospheric Administration
NMDMP	National Marine Debris Monitoring Program
NPDES	National Pollutant Discharge Elimination System
NWHI	Northwestern Hawaiian Islands
NWR	National Wildlife Refuge
PICO	EPA Pacific Islands Contact Office
PIFSC	Pacific Islands Fisheries Science Center
PMNM	Papahānaumokuākea Marine National Monument
POP	Pacific Ocean Producers
PSA	Public service announcement
PSC	NOAA Pacific Services Center
TMDL	Total maximum daily load

Hawai'i Marine Debris Workshop Summary

UH University of Hawai'i
USCG U.S. Coast Guard
WPFMC Western Pacific Fisheries Management Council

1.0 INTRODUCTION

The Marine Debris Research, Prevention and Reduction Act (MDRPRA) was signed into law on December 22, 2006. The MDRPRA established a Marine Debris Prevention and Removal Program (Marine Debris Program) within the National Oceanic and Atmospheric Administration (NOAA), provided directives for the U.S. Coast Guard (USCG), and re-established the Interagency Marine Debris Coordinating Committee (IMDCC). To fulfill certain directives outlined in the Act, NOAA is holding regional workshops in marine debris “hotspot” areas—regions where marine debris activities have been occurring for many years and where marine debris has adversely affected trust resources or navigation. To improve the level of discussion and to focus the desired outcomes at these regional workshops, NOAA has conducted planning meetings with local marine debris experts in some of the hotspots to identify priority topics that should be addressed in the regional workshops.

For the Hawai'i region, a planning meeting was held on June 21, 2007, at the conference room of the Papahānaumokuākea Marine National Monument and NOAA's National Marine Sanctuary Program in Hawai'i Kai, Hawai'i. Twenty-one marine debris experts in Hawai'i—from state and federal government agencies, academia, and the private sector—convened to discuss marine debris issues, potential topics for the regional workshop, and anticipated outputs from the workshop. Participants highlighted the need for a comprehensive approach to address marine debris issues that includes research, education and outreach, land-based pollution prevention, and beach and reef debris removal. In addition, participants recommended that the Hawai'i workshop result in specific outputs, such as a preliminary plan to prioritize marine debris efforts in the main Hawaiian Islands (MHI) as well as the Northwestern Hawaiian Islands (NWHI).

The Hawai'i Marine Debris Workshop was held on January 16 and 17, 2008, in the Pacific Guardian Center in Honolulu, Hawai'i. This workshop incorporated recommendations from the planning workshop. The workshop agenda is provided as Appendix A. Thirty-four members of the marine debris management community in Hawai'i, from federal, state, and local government agencies, nongovernmental organizations, and the private sector, met to discuss marine debris issues and activities and developed a working draft of priority actions for the next five years. The participant list is provided as Appendix B. The workshop objectives and mechanics are described in section 2.0. Workshop outputs are described in section 3.0 and provided in Appendices C and D. A summary of the participants' evaluation of the workshop is provided in Appendix E.

2.0 WORKSHOP OBJECTIVES AND MECHANICS

The Hawai'i Marine Debris Workshop brought together members of Hawai'i's marine debris management community. The overall objectives of the workshop were to:

- Share current best practices, ongoing activities, and success stories
- Identify marine debris priority actions for the next 5 years
- Begin the development of a local action strategy for marine debris
- Obtain commitment from participants to follow through with local action strategy development and actions

The workshop was conducted over a 1½-day period on January 16 and 17, 2008. The workshop agenda is provided as Appendix A. During the morning of the first day, presentations were made by members of the Hawai'i marine debris management community. The presentations addressed topics related to research, education and outreach, and debris prevention and removal activities, as follows:

- Ms. Kris McElwee from the NOAA Marine Debris Program provided an overview of the MDRPRA and its relevance to the workshop.
- Ms. Carey Morishige presented highlights of environmental, economic, and health and safety impacts of marine debris to provide a context for the participants.
- Dr. Lee Ann Woodward discussed research activities of the FWS and the impact of hazardous material debris.
- LTJG Tony Perry III described derelict net removal efforts in the NWHI and new technologies being proposed for early detection of marine debris at sea.
- Ms. Petra MacGowan presented highlights of the State's coral reef education and outreach program and opportunities for integrating marine debris issues into the 2008 International Year of the Reef campaign.
- Ms. Carey Morishige described national education and outreach efforts and the online educational tool, Marine Debris 101.
- LCDR Dale Shepardson presented U.S. Coast Guard efforts in marine debris removal in the NWHI.
- Mr. Clinton Jamile described the volunteer program for beach cleanup spearheaded by the City and County of Honolulu.

- Ms. Susan Polanco de Couet presented EPA's national perspective on marine debris as well as results of the recently completed National Marine Debris Monitoring Program (NMDMP).
- Ms. Christine Woolaway described beach cleanup efforts conducted through the International Coastal Cleanup Day and NMDMP.

Following the presentations, participants brainstormed marine debris priorities for the next five years in five focus areas: research, education and outreach, land-based pollution prevention, beach cleanup, and reef cleanup. The output of this brainstorming session is provided in Appendix C.

The participants then developed preliminary action plans for select activities within each of the five focus areas considering the input provided during the brainstorming session (Appendix D). Participants described the action needed, characteristics of the marine debris, and the problem addressed by the action. For each action, participants also identified potential partners, measures of effectiveness, and estimated cost.

The preliminary action plans were presented by workshop participants on the morning of the second day. Participants voted on priority actions within each focus area. The results of the voting were tallied and presented to the group (Figure 1). Action leads and next steps were discussed for actions receiving the highest number of votes.

The workshop concluded with a commitment from NOAA and the U.S. Environmental Protection Agency (EPA) to facilitate additional working sessions with interested members of Hawai'i's marine debris management community to finalize the marine debris action strategy and promote the advancement of priority actions already discussed (Table 2).

3.0 WORKSHOP OUTPUTS

Priority marine debris actions for the next five years were identified for each focus area through voting by the workshop participants. These priorities, listed in Table 1, are a subset of actions presented in the preliminary action plan tables (Appendix D).

Priorities were identified by voting. Participants cast votes by focus area for the actions listed in preliminary action plan tables (Appendix D). The voting results for marine debris actions identified in the workshop are provided on Figure 1.

Priority marine debris actions that received the most votes within each focus area were further discussed and developed by the workshop participants.

Table 2 summarizes action lead, action items, recommendations and comments on implementation for priority actions by focus area.

Table 1. Priority Marine Debris Actions Identified by Workshop Participants

RESEARCH	
R6	Establish a pilot program at \$200/ton for fishermen to bring nets into Pier 38 and measure the effectiveness. Publish results (compare with Korea and Chesapeake Bay models).
R8	(a) Track nets in convergence zone and (b) develop detachable sensors.
R11	Quantity (tonnage) of fishing gear vs. quantity lost.
R14	Increase networking of marine debris research.
R15	At-sea surveillance of marine debris for collection and tracking.
EDUCATION AND OUTREACH	
E1	Develop a mechanism for coordinating and distributing core messages across and within organizations.
E2	Public service announcements (PSA) on local TV stations, and weave a marine debris message into storyline of shows such as Da Braddahs.
E3	Cultural context included within outreach and education messages and materials. CURRENT: Use of PSC's panel display tying culture to marine debris.
E7	Foster "sense of place" and responsibility to malama 'aina in children using Hawaiian cultural values to reinforce the lesson.
E8	Develop signage on impacts of marine debris at public shorelines, marinas, piers, boat ramps, beach parks. Tailor signs to different users. Message on trash cans to encourage use and inform public.
E16	Develop communications training program and/or regular communication training for outreach professionals – give them more tools!!
E18	Adopt-a-Beach program for schools.
LAND-BASED POLLUTION	
L1	Review permitted municipal stormwater facilities to ensure implementation of management measures such maintenance of storm drains and use of BMPs such as storm drain filters (NPDES permits, EPA permits regulated by DOH).
L4	Reduce amount of pollutants that enter the stream/river/ahupua'a by working with sources (e.g. businesses, industrial areas, residential areas, construction sites) to implement BMPs.
L5	Decrease bureaucracy and increase curbside recycling to make it easier and convenient for the public to recycle.
L7	Establish incentives for use of biodegradable products for industries and businesses (land and sea, e.g. cruise ships) as well as disincentives for non-use.
L8	Establish incentive for non-use of plastic bags and disincentives for continued use through policy reforms
L11	Increase enforcement regarding litter, illegal dumping.
L13	Ensure ample or more appropriate receptacles at access sites, including recycling receptacles.
BEACH CLEANUP	
B1	Replicate monofilament recovery and recycling project (SE Region) in Hawai'i.
B3	Create disposal sites for nets at more harbors, boat ramps
B5	Support and increase participation for International Coastal Cleanup (ICC) Day in Hawai'i (Get the Drift and Bag It!). Include media for event sponsors, provide incentives for volunteers, and increase dive club participation.
B6	Increase incentives for beach cleanup or reward system. Best incentive is often food (create a sense of community or experience).
REEF CLEANUP	
F1	Create/establish a clearinghouse for marine debris that needs removal and information on agencies and organizations that provide training or have equipment or ships available to transport marine debris.
F5	Increase capability to respond to debris/nets in MHI waters. Develop hotline, tiered response network, response team for removal, and removal training.
F9	Provide disposal sites for nets at neighbor island harbors and territorial harbors.

Note: Priority actions were identified by participant voting on actions by focus area listed in Appendix D

Figure 1. Priority Marine Debris Actions Identified by Participant Voting (see Appendix D for list of all actions)

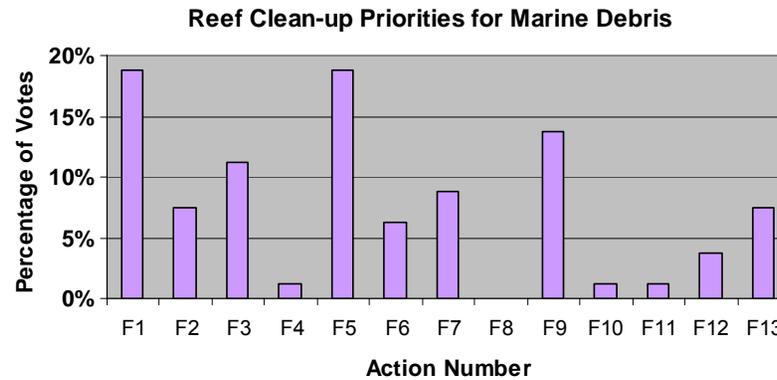
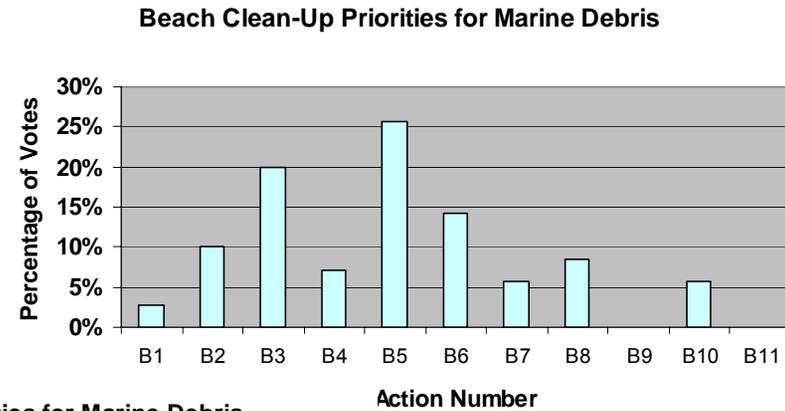
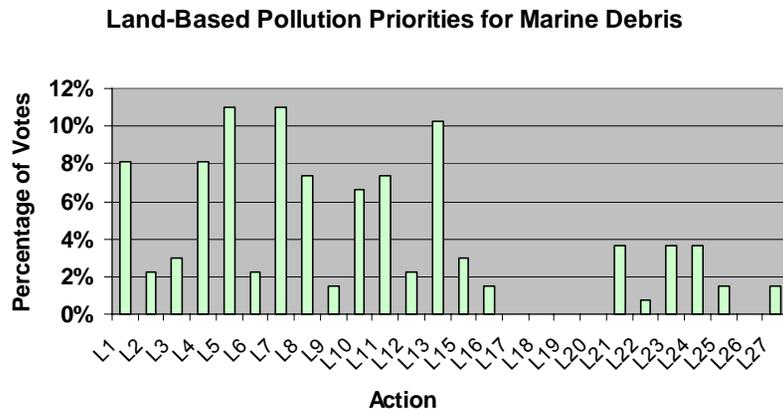
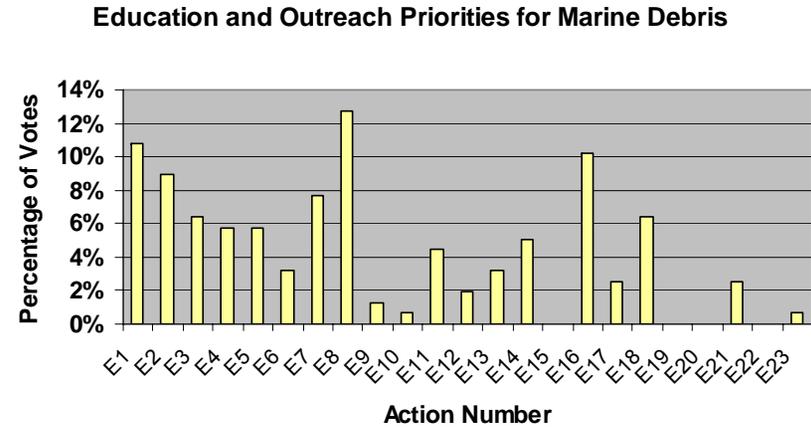
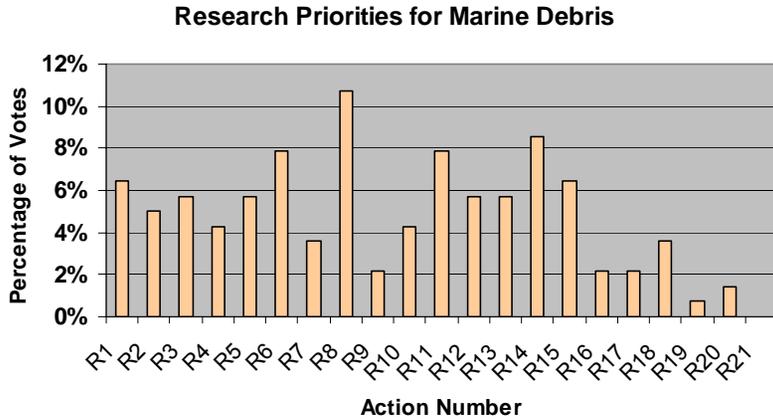


Table 2. Implementation Work Plan for Selected Priority Marine Debris Actions¹

	Priority Action	Partner Leads	Next Steps	Recommendations	Comments
R6	Establish a pilot program at \$200/ton for fishermen to bring nets into Pier 38 and measure the effectiveness. Publish results (compare with Korea and Chesapeake Bay models).	NOAA Fisheries (Lindsay Yates), WPMC, Trash to Energy partners	<p>Conduct a feasibility study to determine if Pier 38 program should be expanded.</p> <p>Check on status of legal research on liability – Sea Grant Law Program.</p>	<ul style="list-style-type: none"> Expand the program to small recreational fishermen by providing receptacles for monofilament lines and small nets. Need to work out logistics of weighing and payout 	<ul style="list-style-type: none"> The proposed figure of \$200/ton was previously discussed with fishermen by Howard Wiig. Lindsay Yates cautioned that the ongoing program is free and working. Schnitzer Steel Hawai'i, currently taking in nets for recycling, may not be willing to receive an increased volume of nets without compensation.
R8	(a) Track nets in convergence zone and (b) develop detachable sensors.	State DBEDT (Howard Wiig), Papahānaumokuākea Marine National Monument (Russell Reardon), NOAA PIFSC (LTJG Tony Perry III)	Set up discussion group with all partners to determine available resources and coordinate individual efforts.		<ul style="list-style-type: none"> Efforts in this action can be directly linked to priority action R15.
E8	Develop signage on impacts of marine debris at public shorelines, marinas, piers, boat ramps, beach parks. Tailor signs to different users. Message on trash cans to encourage use and inform public.	HIHWNMS (Paul Wong)	Hold a meeting with relevant officials and partners to develop a work plan.	<ul style="list-style-type: none"> Use a simple unified message chosen by the marine debris community. Hold school contest to develop signs. Need to get buy-in from community. Need to work with counties on permission to put signage up. Possible Partners: Association of Counties 	<ul style="list-style-type: none"> Paul Wong, HIHWNMS has already submitted a proposal to NOAA Marine Debris Program to develop signage. One recommendation is to use a simple unified message chosen by the marine debris community. Liz Foote has done signage on corals like this on Maui. Integrate with Priority

Table 2. Implementation Work Plan for Selected Priority Marine Debris Actions¹

	Priority Action	Partner Leads	Next Steps	Recommendations	Comments
					Action L13 (Ensure ample or more appropriate receptacles at access sites, including recycling receptacles).
L7	Establish incentives for use of biodegradable products for industries and businesses (land and sea, e.g. cruise ships) as well as disincentives for nonuse.	EPA – Hawai'i (Susan Polanco DeCouet)	Hold a meeting with relevant officials and partners to develop a work plan.	<ul style="list-style-type: none"> Partner with other organizations that champion this cause (e.g., Green Hotel Association, Styrophobia, Dept. of the Navy, and research groups that are doing research with biodegradable materials such as Stopstyrofoamhawaii.org). Develop award for businesses that implement green practices. 	<ul style="list-style-type: none"> Efforts in this area can be linked to priority action R4 (Quantify biodegradation rates and toxicity of alternative and frequently used materials). How do we make this incentive program sustainable?
B5	Support and increase participation for ICC in Hawai'i (Get the Drift and Bag it!). Include media for event sponsors, provide incentives for volunteers, and increase dive club participation.	ICC, Ocean Conservancy (Chris Woolaway)	Coordinate with CRON's International Year of the Reef efforts. The goal is to achieve record participation in ICC this year.	<ul style="list-style-type: none"> Ask business to donate products as incentives for volunteers. Possible partners: CRON, schools, hotels, ecotourism businesses. 	<ul style="list-style-type: none"> Integrate efforts with priority actions B8 (Business partnership/ sponsor cleanups), B9 (Inter-scholastic contests), and B6 (Increase incentives for beach cleanup or reward system).
FI	Create/establish a clearinghouse for marine debris that needs removal and information on agencies and organizations that provide training or have equipment or ships, available to transport marine debris.	Coast Guard (LCDR Shepardson) and Chris Woolaway	<ul style="list-style-type: none"> Develop a list of pickup service providers. Develop list of potential groups that will request pickup service. 	<ul style="list-style-type: none"> Use Keep America Beautiful's partnership with Google as an example. 	<ul style="list-style-type: none"> Efforts should be coordinated with priority action F7 (Establish centralized geospatial database of reports to facilitate response). USCG may be able to host on their website.

1 – The implementation work plan describes priority actions that received the most votes from actions listed in Appendix D. Due to time constraints participants were only able to discuss one priority action per focus area except for research.

APPENDIX A

WORKSHOP AGENDA

Hawai'i Marine Debris Workshop
January 16 & 17, 2008
Pacific Guardian Center
Makai Tower, ground floor conference room
733 Bishop Street
Honolulu, HI 96813

AGENDA
Wednesday, January 16, 2008
8:00am – 4:30pm

Time	Topic
8:00 - 8:30am	Check-in and coffee
8:30 - 9:00am	Welcome and Introductions
9:00 - 9:30am	Workshop Objectives and Overview + Background
9:30 - 9:45am	BREAK
9:45 - 10:15am	Presentations: Research Activities <ul style="list-style-type: none">• <i>U.S. Fish and Wildlife Service</i>• <i>NOAA Pacific Islands Fisheries Science Center</i>
10:15 - 10:45am	Presentations: Education and Outreach <ul style="list-style-type: none">• <i>Division of Aquatic Resources, DLNR</i>• <i>NOAA Marine Debris Program</i>
10:45 - 11:40am	Presentations: Prevention and Removal Activities <ul style="list-style-type: none">• <i>U.S. Coast Guard</i>• <i>City and County of Honolulu and U.S. Environmental Protection Agency</i>• <i>Christine Woolaway</i>
11:40am - 12:45pm	LUNCH (<i>On your own</i>)
12:45 - 2:00pm	Marine Debris Priorities for the Next 5 Years
2:00 - 2:15pm	BREAK
2:15 - 4:30pm	Action Plan Development

Hawai'i Marine Debris Workshop
January 16 & 17, 2008
Pacific Guardian Center
Makai Tower, ground floor conference room
733 Bishop Street
Honolulu, HI 96813

AGENDA
Thursday, January 17, 2008
8:00am – 12:00pm

Time	Topic
8:00 - 8:30am	Check-in and coffee
8:30 - 10:00am	Action Plan Review
10:00 - 10:15am	BREAK
10:15 - 11:30am	Opportunities for Partnerships and Resources
11:30am - 12:00pm	Next Steps and Closing

APPENDIX B

WORKSHOP PARTICIPANTS

Hawai'i Marine Debris Workshop Summary

Participants of Hawai'i Marine Debris Workshop

Last	First	Title	Organization	Email	Phone
Bartlett	Nicole	Recreational Fisheries Coordinator	NOAA Fisheries Service Recreational Fisheries	nicole.bartlett@noaa.gov	(808) 944-2151
Carroll	Paula	Civilian	U.S. Coast Guard (retired)	paula-carroll@hotmail.com	(808) 375-0917
Chandler	Rae	Coordinator	Community Work Day Program	cwkdhb@pixi.com	(808) 877-2524
Gilmartin	Bill	Director of Research	Hawai'i Wildlife Fund	bill-gilmartin@hawaii.rr.com	(808) 985-7041
Hester	Michelle		Oikonos	michelle@oikonos.org	(808) 228-4463
Ho	Wilfred	District Manager, Windward	City and County of Honolulu – Parks and Recreation	WMHo@honolulu.gov	(808) 233-7303
Inn	Clifford	Boating Safety Education Specialist	Division of Boating and Ocean Recreation	clifford.g.lnn@hawaii.gov	(808) 587-1972
Jamile	Clinton	Coordinator, Volunteers in the Park Program	City and County of Honolulu Department of Parks and Recreation	cjamile@honolulu.gov	(808) 768-3034 (808)351-1642 c
Keenan	Elizabeth	Research Specialist	Papahānaumokuākea Marine National Monument	Elizabeth.Keenan@noaa.gov	(808) 694-3945
Kingma	Eric	NEPA Coordinator	Western Pacific Regional Fisheries Management Council	Eric.Kingma@noaa.gov	(808) 522-7497
Longobardi	Pam	Professor of Art	Ernest G. Welch School of Art and Design Georgia State University	plongobardi@gsu.edu	(404) 409-6750
McElwee	Kris	Pacific Islands Program Coordinator	NOAA Marine Debris Program	Kris.Mcelwee@noaa.gov	(808) 532-3207
McGowan	Petra	NOAA Coral Management Fellow	Department of Land and Natural Resources Division of Aquatic Resources	petra.macgowan@hawaii.gov	(808) 587-0098
Meyer	Marnie	Planning and Policy Analyst	Hawai'i Coastal Zone Management Program	mmeyer@dbedt.hawaii.gov	(808) 587-2831
Miura	Teri	Aquatic Program Assistant	County of Hawai'i, Parks and Recreation, Aquatics	terry_miura@yahoo.com	(808) 961-8695

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Last	First	Title	Organization	Email	Phone
Morishige	Carey	Pacific Islands Outreach Coordinator	NOAA Marine Debris Program	Carey.Morishige@noaa.gov	(808) 397-2651 x256
Murakawa	Scott	Environmental Health Specialist	State of Hawai'i Department of Health Clean Water Branch	scott.murakawa@doh.hawaii.gov	(808) 586-4309
Perry III	LTJG Tony	Principal Investigator	NOAA Corps / NOAA Fisheries Service Pacific Islands Fisheries Science Center	Tony.Perry.III@noaa.gov	(808) 944-2114
Polanco DeCouet	Susan	Environmental Specialist	Environmental Protection Agency, Region 9, PICO Office	Polanco.Susan@epamail.epa.gov	(808) 541-2722
Reardon	Russell	Resource Protection Specialist	Papahānaumokuākea Marine National Monument	russell.reardon@noaa.gov	(808) 397-2660 x264
Sbeih	Nadia	Outreach Coordinator	NOAA Pacific Services Center	nadia.sbeih@noaa.gov	(808) 532-3204
Shepardson	LCDR Dale	Chief, Waterways Management Branch	U.S. Coast Guard	dale.v.shepardson@uscg.mil	(808) 541-2320
Taylor	Jeffrey	Navigation Manager	NOAA Office of Coast Survey	Jeffry.taylor@noaa.gov	(808) 532-3202
Vanderlip	Cynthia	Kure Atoll Wildlife Sanctuary Manager	Department of Land and Natural Resources Division of Forestry and Wildlife	cici55@hotmail.com	(808) 352-6218
Walters	Jeff	Co-manager, Hawaiian Islands Humpback Whale National Marine Sanctuary	Department of Land and Natural Resources	jeffrey.s.walters@hawaii.gov	(808) 587-0106
Wiig	Howard	Energy Analyst	Department of Business, Economic Development, and Tourism	hwiig@dbedt.hawaii.gov	(808) 587-3811
Wong	Paul	Operations Coordinator	Hawaiian Islands Humpback Whale National Marine Sanctuary	Paul.B.Wong@noaa.gov	(808) 397-2651 x250

Hawai'i Marine Debris Workshop Summary

Last	First	Title	Organization	Email	Phone
Woodward	Lee Ann	Resource Contaminants Specialist	U.S. Fish and Wildlife Service	LeeAnn_Woodward@fws.gov	(808) 792-9562
Woolaway	Christine	Manager	Chris Woolaway and Associates, LLC	chris@woolaway.com	(808) 753-3311
Yates	Lindsay	Marine Habitat Resource Specialist	NOAA Fisheries Service NOAA Restoration Center	lindsay.yates@noaa.gov	(808) 944-2162

APPENDIX C

ACTIONS IDENTIFIED DURING BRAINSTORMING SESSION¹

¹ Brainstorming outputs were captured slightly differently for each focus area (research, education and outreach, land based pollution, beach cleanup, and reef cleanup) depending on the group reporter.

RESEARCH ACTIONS

Group 1

- International marking of fishing gear for tracking and identification purposes.
- Economic impacts on vessels (transportation), social and natural resources.
- Tracking debris on water – find a sustainable (low-cost) way to track debris to allow for in-water retrieval.
- Surveillance and telemetry tracking for debris (could be as low-tech as an orange buoy).
- Legal research: address liability issues – for vessels of opportunity to pick up debris (like a good Samaritan law).
- Amount of gear being used by various fishing activities per year and how much is lost – engage fishing community in the discussion (gear consumption and annual turnover).
- Monitoring abundance and distribution of fish aggregation devices made of derelict fishing gear.
- Biodegradable plastics research.
- Degradation rates of debris in conditions like NWHI (idea via Lee Ann Woodward).
- Biological impacts: quantify entanglement and ingestion rates comprehensively.

Group 2

- Quantifying impacts of nets on coral reefs, the effectiveness of removal, and recovery rates.
- Small plastics – increase studies in areas with more plastic than plankton – how that affects food web (quantify abundance and distribution of small plastics at sea and their impacts).
- Albatross (and sea turtle and other species) ingestion – look at necropsy studies to determine link between ingestion and mortality.
- Social science research on decision making that leads to sacrificing nets.
- Try to understand sources of marine debris better to be able to target activities better.
- Survey of international research, increase networking of marine debris research internationally.

Group 3

- Establish a pilot program at \$200/ton for fishermen to bring nets into Pier 38 and measure the effectiveness: Does it work? What are glitches? Right amount of \$? And publish results (compare with Korea and Chesapeake Bay models).
- Research whether “degradable” six-pack ring regulation worked and is still in effect.

- Research deep-sea fish farming (to decrease need to use fishing gear); change from hunting to farming (certain fragrance attractor?).
- Research on movement of plastics up the food chain.
- Plastic as biotoxin accumulator – what happens to the toxins once ingested?
- Endocrine disruptors – how much is from marine debris vs. other (and on-land) environmental exposure (e.g., plastic water bottles)?
- Quantify impact of biodegradable plastics degradation (source of nutrients?).

Group 4

- Hormone disruptors.
- Track nets in convergence zone for potential hot spots and other issues.
- Water-column dynamics with pressure sensors (set to auto-release after a set time for recovery).
- Global database of historic, current debris types, locations, impacts, human health, coastal development – use to model, see trends, track effectiveness.
- Fishery observers – quantify gear lost off boats.

Group 5

- Tie research to management actions.
- Net scar research – to improve net removal decision making/protocols.
- Cost/benefit analysis of any activity.
- Develop indices to track trends in marine debris type, abundance; one way is to use biosamplers (bird guts, e.g., for albatross, what % is consumer plastic, from country x, amount).
- Develop standard protocols, institutionalize monitoring so we can actually track progress over long periods (e.g., small plastic on beaches).
- Engage fishermen in cooperative research projects (e.g., gear modifications) .
- Reward fishermen for providing Global Positioning System (GPS) coordinates of nets.
- Look at recommendations from international marine debris conferences (not just in research but all focus areas).

EDUCATION AND OUTREACH ACTIONS

- Communication training for outreach (e.g. internal NOAA staff).
- Create and coordinate outreach and education efforts to better target specific audiences (e.g. beach users, fishermen, international, etc.).
- Curriculum-based projects on marine debris that incorporate various subject areas (e.g. math, geography, etc.); high school curriculum that meets state standards (there is a lot of elementary-level curriculum on marine debris).
- Increase attention to the problem through the use of dramatic images of charismatic megafauna; must be conscious of possible alienation of various stakeholders (e.g. recreational gillnet fishermen and photo of monk seal in gillnet). Make sure message is appropriate to visuals used and to REAL solutions (e.g. photo of entangled monk seal w/ message to recycle).
- Develop a mechanism for coordinating, creating, and distributing core messages and make sure that the message is appropriate to any visuals used.
- Develop or translate outreach materials in the appropriate languages to fit appropriate foreign countries.
- Add cultural context to education and outreach messages and materials. Link the problem to native Hawaiian values of respect for the 'aina.
- Once definition of marine debris is finalized, market and integrate the new definition in outreach materials and messaging.
- Education and outreach must be made a priority and what is said must be backed up with funding.
- Carefully measure and quantify the actual cost and benefit of performance measures for educational/outreach projects – important in a low budget year. Results may suggest a shift in focus from performance measures and evaluation to more of a focus on the actual education/outreach project or campaign at hand. It is usually more costly than the actual project.
- Education program targeted toward audiences and age-appropriate.
- Involve industry in education/outreach projects; possible contributors in funding and/or solution to the problem.
- Involve enforcement in education/outreach projects; development of materials and messaging with information related to marine debris enforcement.
- Link research and education/outreach programs; translate science into information for the public/audiences.
- Information on products (e.g., hang tags): "Proper disposal of this material could prevent it from becoming marine debris."

- Think of ways to increase awareness and visibility of marine debris issues; use PR that works; be strategic. TV and radio are the best, but cost-prohibitive. Outreach events “preach to the choir.”
- Spokesperson for marine debris (famous face).
- Work through partnerships; e.g., partner with hotels to get out messaging or materials. Problem: Many chains have a set way for things (e.g., room design) so although they liked the message, they didn't buy in. Find the right person/people.
- Outreach signage at all beach-access areas.
- Outreach to fishermen not only in U.S., but also internationally on the impacts of marine debris.
- Survey of volunteers after beach cleanups – What did they learn? Would they come back?
- Increase the size of large-scale events like the ICC, bigger. Get the word out more through increased partnerships (e.g., CRON), sponsors, media, etc.
- Focus messages or activities (e.g., Chesapeake Bay campaign focused on one message). Make it simple. Don't duplicate someone else's message.
- Target children (e.g., approximately 5th grade) with messages and materials so that they grow up with that information and talk to parents. (e.g., Drug and Alcohol Recovery and Education [DARE] Program).
- Expand awareness of land-based origins as primary source of marine debris.
- Large-scale trash-to-art program – tactile, tangible, thoughtful.
- Think of better things that folks can do make a difference; must be convenient and simple. Have a tax fee on products and make recycling mandatory. Outreach targeted to legislators.
- Environmental stewardship award. Work with schools and have students participate. “Good citizen” reward for positive environmental behavior. Start with schools and expand.
- Education and outreach on results and ramifications of a “throw-away” culture to global new markets.
- Marine debris international conference.
- Notice to mariners (publication that comes out weekly) on locations of debris for navigational safety/places to avoid.
- More PSAs.
- Educational cruises to see marine debris impacts for fishermen/targeted groups.
- Class in multiple languages on marine debris.
- Marine debris messaging on trash cans in public areas to encourage their use.
- Message in the phonebook or other item that everyone gets (e.g. insert w/ electricity bill or water bill).

Hawai'i Marine Debris Workshop Summary

- Target Oceanic Cable for sponsorship – PSAs, show topics, Da Braddahs, Outdoor Hawai'i segments, Hawai'i Diver.
- Target Newspapers in Education – special insert; sponsorship by Honolulu Advertiser?
- Marine debris mascot/campaign – turtle or seal (e.g. Tangle the Turtle).
- Train dolphins/seals to locate nets and develop outreach campaign with kids around this.
- Create a marine debris video piece for hotel TV.
- Partner with Kona Brewing Co. to create a special marine debris beer w/ messages on the labels and proceeds going to a marine debris efforts. Special edition beer w/ education campaign.
- Marine debris song – children's version and adult version.

LAND-BASED POLLUTION ACTIONS

Group 1

- Source Control: keep debris from going to the ocean.
 - Identify priority land-based pollution sources: hot spots within ahupua'a.
 - Establish priority criteria: biological to hazardous.
 - Priority removal activities.
 - Use ahupua'a-based approach recognizing connection between land and sea.
 - Facilitates use of databases from different organizations.
- Ramp up Total Maximum Daily Load (TMDL) Program to integrate trash in TMDL study.
 - TMDL establishes pollutant load for a rivers and watersheds. Example from Los Angeles river where trash established under the TMDL Program as a pollutant of concern.
 - State DOH should add trash (marine debris component) to existing TMDL study.
- Revitalize storm drain stenciling program.
 - Dump no waste—goes to storm drains.
- Adopt-a-stream program for cleanup and education purposes.
- Conduct anti-litter campaign for visitors and residents; reinstitute State office dedicated to anti-litter campaign.
- Encourage fast food businesses to use biodegradable straws, forks.
- Encourage recycling programs.

Group 2

- Develop multilingual outreach materials for outreach and education.
- Develop statewide campaign to promote reduction (e.g., Don't mess with Texas).
- Beach-based outreach informational sign and information sheet on land-based pollution prevention (e.g., turtle info booth at North Shore).
- Take pictures of people littering and post on website.
- Everything must be recycled.
- Get marine debris agencies (NOAA, State, county people in the room today) to commit to recycling.
- Improve recycling in HI and change what materials are used; achieve compliance with present and new laws through rewards system.
- Require all federal, state, and county agencies to commit to recycling.
- Establish a functional public reporting system for land-based pollution sightings, illegal dumping.

Group 3

- Education of problem: pack it in and pack it out.

- Look at programs to reduce, reuse, recycle plastic bags (e.g., Big Island grocery store will give you discount for taking own bags or bringing in plastic bags).
- Use plastic bags as an opportunity to educate on behavior change.
- Behavioral change, more emphasis on litter.
- Conduct social marketing campaign to change littering behavior on land and sea.
- Incentivize recycling; make it easy (not just household items, construction materials, batteries, lead).
- Need government to buy into recycling.
- Continue/enhance stream cleanups, institutionalize for long-term sustainability.
- Clear up who manages stream.
- Incorporate ahupua'a concept of interconnectedness of land and sea.
- Educate people on hydrology of Hawai'i; unlike on the mainland, garbage in streams goes quickly to the sea.
- Improve stream management and flood control.

Group 4

- Target large companies, especially construction companies, to responsibly dispose of solid waste, construction debris.
- Maintain/clean out storm drains, canals, streams to prevent influx of debris to the ocean.
- Increase enforcement of anti-litter and anti-dumping laws (uncovered trucks, littering, dumping).
- Policy reform to ban plastic bags (San Francisco and Bangladesh have banned. Maui is trying to pass law to phase out, can use biodegradable bags, in County Council; Mayor is handing out recyclable bags and getting signatures to support bill to phase out plastic bags).
- Establish recycling as social norm at parks, schools because Hawai'i is an island state with limited disposal capacity.
- Make fast food take-out materials out of recyclable or eco-friendly materials.
- Advertise and give incentives to businesses that use, make and sell biodegradable cups, etc. (e.g., Styrophobia).
- Have a disincentive or tax on nonbiodegradable and nonrecyclable materials and use money to help schools.
- Increase understanding that green waste should not go down storm drains as well as other solid waste.

Group 5

- Ban plastic bags (Bill 83, City and County of Honolulu).
- Reduce littering on land (approximately 25 percent of land-based material goes to the sea).
- Establish a plastics surcharge for plastic bags.
- Establish incentive for cloth bags.

Hawai'i Marine Debris Workshop Summary

- Quantify the amount (percentage) of litter on land that goes to the sea.
- Identify entrance points and filter solid debris from land so that it does not go to the sea (Susan).
- Expand storm drain/canal cleaning and install grates/filters throughout the year.
- Restore wetlands as a natural filter.
- Look at Los Angeles County model of steel storm drain traps (Susan).
- Discourage use of plastic water bottles, contamination of water in plastic bottle.
- Launch campaign about health risk of refilling water bottles.

BEACH CLEANUP ACTIONS

Group 1

- Eco-Refinery on Midway:
 - Reasoning: creates a place to put the debris and a positive use for what is usually viewed as waste. Creates a market for marine debris.
 - Pros: Reduces diesel cost on remote areas. Avoid cost of off-island trash.
 - Cons: Resource: \$600K to \$250K (machines are available). Take advantage of creating another H-Power structure (to handle garbage on island instead of shipping it away). Midway could be the focus of a pilot project. Currently H-Power can only burn 75%.
- Focus on volunteer and collaborative efforts.
- Resources: continue partnership through Matson (organized through "word of mouth"). Forge cross-discipline and entities (using more mainstream media and grassroots organizations such as Surf Rider).
- Priority Item #3: Drift web art (display 1 day for 25 feet in diameter).
 - Reasoning: Idea is to promote web of life and shows a connection from land to sea.
 - Pros: Utilizes artistic expression to reach different audiences. Creative way to promote a message. Transform garbage into something useful or educational.
 - Resources: "Trash-to-Art" project. May display the work in front of city hall or aquarium; the Mayor likes recycling projects and art displays. Use media event (press release) to physically follow a beach cleanup event.
- Priority Item #4: Combine water quality testing with marine debris pickup.
 - Resources: Follow examples of programs such as SurfRider that combines water quality sampling with beach cleanup.
- Overarching Theme 1: Main theme for each priority item: how to change mindset about "waste" and develop uses for debris.
- Overarching Theme 2: How to influence mindset and show people how to be creative to start grassroots initiatives (targeting the individual as accountable). All about consciousness awareness.

Group 2

- Priority Item #1: Initiative to partner with schools to adopt a beach.
- Priority Item #2: Volunteer "working" vacations and hotel sponsors.
 - Resource: tow divers (snorkel trips). Kawainui marsh.
- Priority Item #3: Business partnership/ sponsor cleanups.
 - Resource: Matson Container.
- Priority Item #4: Partner with existing contest.
 - Resource: Market as "biggest fish or biggest trash" or "extreme trash races" similar to the military's "swamp ramp"

- Priority Item #5: Include beach cleanup as a prerequisite for obtaining a permit.
 - Resource: target recreational boat community.
- Priority Item #6: Partner with recycling campaigns.
- Priority Item #7: More trash cans on beach.
 - Resource: Kahikinui will give you a butt can distribution. Use public awareness art on the trash cans. Similar to “cows in Chicago” or “artistic painting for fishing boats in Maine.”
- Priority Item #8: Provide cigarette butt container with fine for tossing, or HI 5-cent refund.
- Overarching Theme 1: Target the ocean recreational users and existing events.
- Overarching Theme 2: Focus on PR. Getting businesses good publicity.

Group 3

- Priority Item #1: Replicate Volunteer Parks program for beach cleanups and diversify volunteer group types.
 - Reasoning: Build on something that already works. Many people don't know where to start or how to initiate a beach cleanup on their own.
 - Resource: Establish long-term relationships with groups to volunteer and work on making volunteer experience flexible and rewarding.
- Priority Item #2: Network of monofilament (Mono Recovery) recycling sites.
 - Resource: Use NOAA Southeast region model (e.g., Florida and 12 NGOs) to create monofilament recycling project. Create a network of physical recycling sites (such as 55-gallon drums). Already have a net recycling system that may also be used for monofilament recycling. Targeted on recreational users and focusing on hot spots such as parks or boat ramps.
- Priority Item #3: Disposal sites for nets on neighbor islands.
 - Reasoning: Need to make recycling more convenient.
 - Resource: Expand sites so it is not just at Pier 38.
- Priority Item #4: Organize emergency cleanups.
 - Reasoning: Cleanups are timing sensitive; should be followed by storms.
 - Resource: Have a trained “weather crew” for beach cleanups during weather events.
- Priority Item #5: Outreach messages on trash receptacles in high-profile areas (such as beaches).
 - Reasoning: Draw attention to disposal sites. Use real pictures to show the impact of marine debris on wildlife.
 - Resource: Partner with County Parks and Recreation.
- Priority Item #6: Ensure ample or more appropriate receptacles at access sites, including recycling receptacles.
- Priority Item #7: Quantify effectiveness of beach cleanups.

- Reasoning: Need to show impact of beach cleanup and what is lost when beach cleanups don't occur. Link land-based pollution to circulation in ocean and sea bird issue.
- Resource: NWHI doesn't clean up plastics.
- Priority Item #8: Plastic compactor for NWHI.
 - Reasoning: Reduce cost of transporting waste.
- Overarching Theme 1: How to take advantage of existing government initiatives and use models from other successful projects.
- Overarching Theme 2: Create physical sites or containers to make cleanup an everyday activity that is convenient.

Group 4

- Priority Item #1: Focus on public outreach for beach cleanup need and advertise existing events.
 - Reasoning: Need to focus on publishing successes to track progress.
 - Resources: Public Release.
- Priority Item #2: Clearinghouse for all beach cleanups (Website).
 - Reasoning: Capture and inventory all the volunteer beach cleanups. Identify and track the type of debris found (such as black plastic tubes).
- Priority Item #3: Encourage teachers to incorporate beach cleanup in cross-disciplinary learning (i.e. art, science, math, media etc.).
 - Resource: Big Island Charter Schools.
- Priority Item #4: Quantify success.
 - Reasoning: Show the value and need for continuing support for beach cleanup.
 - After a cleanup the government agencies pick up the larger cleanup and transport, the cost of this not documented.
- Priority Item #5: Need to target "overlooked" groups such as government workers that need to pick up debris after a beach cleanup.
 - Reasoning: Need to educate decision-makers or government groundskeepers that are already working land. Need to get these people individually invested.
- Priority Item #4: Target service learning for higher education programs.
- Priority Item #5: Need to target programs for how each county works.
- Priority Item #6: Need to coordinate county and state interface for disposal fees and roles.
- Priority Item #7: Point of contact for public to organize a trash pickup. Reporting hotlines.
- Priority Item #8: Address liability issues to encourage and support long-term grassroots efforts.
 - Reasoning: Don't restrict local community groups from stewardship actions.
 - Resource: Work on agency missions. Create standardized liability (state and federal) form to cover people under workman's comp.

National Sea Grant Law Center to identify liability in state and federal law and circulate. Indemnification and insurance clarification (won't cover diving but will cover land-based cleanups).

- Resource: Develop an interagency process that can be advertised to the public.
- Overarching Theme 1: Expand public awareness campaign to target groups.

Group 5

- Priority Item #1: Increase visibility and participation of International Coastal Cleanup Day ("Get the Drift and Bag It") and sponsorship.
- Priority Item #2: Target established volunteer organizations (who) and promote ownership (how). Locally-targeted volunteer efforts.
 - Reasoning: Foster sense of place in children
 - Resource: Rotary, Girl Scouts, churches, and starting with schools. Hawaiian families follow lead of children; promote support of next generation. Use Hawaiian values of family and multigenerational planning. Cultural connection to nature.
- Priority Item #3: Increase incentives for beach cleanup or reward system.
 - Resource: Matson gives community groups \$1k (how does this filter down to individual). Individual t-shirts or gift certificate if you bring a certain amount of volunteers. Best incentive is often food (create a sense of community or experience).
- Priority Item #4: Rotate school group cleanup with a contest combined with debris that would be displayed. Interscholastic contests.
 - Based not just on amount of debris but creativity in multiple uses for "waste." Reaching artists and scientific-minded learners.
 - Resource: Year of Reef conference recognition.
- Priority Item #5: Create a tool to combine beach cleanup with long-term profiling of the beach and tracking progress. Combine beach analysis and cleanup. Promote long-term monitoring for local beach attached to schools.
 - Resource: Is there an existing curriculum (SurfRider). Use of data cards.
- Overarching Theme 1: People want to help people, how do we make it easy? (Have plenty of supplies but need more bodies).
- Overarching Theme 2: Need to increase stewardship of your own ahupua'a.
- Overarching Theme 3: Need to start with children to instill a mentality of stewardship.

Reef Cleanup Actions

- Expand net recycling for recreational boaters and fishermen (Pier 38).
- Make underwater dive cleanups regular occurrences.
- Integrate/coordinate efforts with other cleanup groups (algae, invasive species, etc.).
- Increase signage at beach areas, marinas, and marine shops to let people know about impacts of debris on reefs.
- Monitor effectiveness of cleanups.
- Require identification on all products that are big offenders indicating that the product is potential marine debris and should be disposed of appropriately.
- Develop a repository of data on collected marine debris and pickup needs to inform Coast Guard, other agencies, and organizations.
- Institute tow-diving techniques for the MHI.
- Global effort for a Superfund cleanup in convergence zone, with international partnerships.
- Refund/rebate to fishermen for turning in found marine debris - \$200/ton.
- Small bags for material pickup – 20 cents/lb.
- Global cooperation on net tagging/identification.
- Incentives to fishermen to tag encountered floating marine debris with a GPS tag.
- Outreach to dive shops and dive cruises; instruct their divers to come back with a piece of trash.
- Institute a tax for owning net/gear; renew annually.
- Create accountability by requiring tags and increasing knowledge of net ownership.
- International outreach regarding nets/drift (multilingual).
- Increase international enforcement of net/gear dumping.
- Add marine debris categories for fishing tournaments (a competitive category as part of the event).
- Guidelines for debris removal by the public, including instructions to not attempt removing large nets for safety reasons.
- Reporting hotline for marine debris.
- Increasing the State's capability to respond and remove marine debris (need a minimum team of 4 people to remove a small net).
- Regular collaboration with local fishing/diving clubs and dive shops; engage them in the efforts and use them to transfer message to tourists.
- Centralized geospatial database of sighted nets in Hawai'i to facilitate response. Include a website where the public can indicate sightings.
- Increase support and capabilities for marine wildlife disentanglement.
- Training to minimize ecological damage from removal efforts.
- Better linkage with dive shops. Strengthen partnerships.
- DLNR – boat, equipment, trained divers.

Hawai'i Marine Debris Workshop Summary

- Clarify jurisdiction.
- Expand Pier 38 to state and territorial harbors.
- Clarify liability.

APPENDIX D

PRELIMINARY ACTION PLANS²

² Due to time limitations, some Preliminary Action Plan tables are incomplete.

Focus Area: RESEARCH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed (see table legend)			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost (see table legend)
		Debris Type	Location	Impact Type				
R1	Institutionalize long-term quantification of ingested marine debris trends in abundance, distribution, and type – seabirds as biosamplers.	1-8	9, 10, coordinate with studies in 11	18, 19, 23	Provides a measure of success and data to guide action and outreach targets.	Seabird colony: FWS, DLNR. Coordinate with current programs: EPA, Oikonos	Sufficient data to show trends and inform action.	A (protocols exist already)
R2	Institutionalize long-term quantification of beached marine debris trends in abundance, distribution, and type; university student involvement in quantifying.	1-8	9	17, 19, 24	Provides a measure of success and data to guide action and outreach targets; measure results of cleanup efforts and engage students.	Ocean Conservancy, HPU, high school sciences	Sufficient data to show trends and inform action.	A (protocols exist already)
R3	Tie research to management action.	All	All	All	Issue: don't spend funds on research that does not lead to a management action that addresses the marine debris problem. No research for sake of research!	All government agencies	More funding to address source reduction and cleanup. No funds for unnecessary research.	None, saves \$
R4	Quantify biodegradation rates and toxicity of alternative and frequently used materials.	2,4,5, 6, 8	All	12, 17-24	Provides data to inform campaigns in support of solutions.	Universities, packaging industry, EPA	Ability to provide wise solutions.	B
R5	Engage fishermen in cooperative research, e.g., net analysis, gear testing, etc.	Any	9-11	Any	Fishermen are experts on the water and fish habitat and behavior. Take advantage of their expertise by using them to collect data, test gear, or even do research.	NOAA, fishing clubs	No. of cooperative projects with fishers; more buy-in from community on research results.	A

Focus Area: RESEARCH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed (see table legend)			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost (see table legend)
		Debris Type	Location	Impact Type				
R6	Establish a pilot program at \$200/ton for fishermen to bring nets into Pier 38 and measure the effectiveness. Publish results (compare with Korea and Chesapeake Bay models).	2	11-gyre	12-14, 19-24	A debris container exists at Pier 38 but only 20T have been collected in 2 years. A bounty would supplement fishermen's income. Pilot study would determine if the dollar amount is correct and pinpoint methods for launching major program.	Longliners, POP, NOAA, DBEDT, Schnitzer, USCG	A dramatic increase in tonnage brought to Pier 38 – a minimum of 10T a month.	B
R7	Research high seas plastic particle ingestion, from jellyfish up the food chain to the supermarket.	6	11- gyre	8, 15,	A correlation between the "magnetic" effect of plastic particles and toxins in supermarket fish has not been established.	NOAA, UH, national labs	A paper documenting (a) toxin accumulation on particles, (b) accumulation in jellyfish, (c) accumulation in harvested fish, and (d) content in supermarket fish.	B
R8	(a) Track nets in convergence zone and (b) develop detachable sensors.	2	11-gyre	13-15, 17, 19	(a) The drift pattern of large net accumulations has not been established. (b) They're a navigational hazard. A small buoy equipped with GPS/PV and flashing LEDs could be attached to net by fishermen (\$25/attachment).	Manufacturing, NOAA, USCG, DBEDT	A pilot program deploying 50 buoys results in 50 attached buoys tracked by USCG until picked up.	A

Focus Area: RESEARCH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed (see table legend)			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost (see table legend)
		Debris Type	Location	Impact Type				
R9	Legal research to protect parties when picking up debris.	2, 6	11-gyre	15	The Sea Grant Law Center in Oxford, MS, has already ruled on the matter. Have them write a full legal paper.	NOAA, fishermen	Assurance by fishermen and attorneys that retrieving net does not constitute liability.	A (very little)
R10	(a) Plastic (particles) as a biotoxin accumulator. (b) Endocrine disruption – how much from marine debris? How much from other plastics, e.g., bottles?	4, 6	11-gyre	15, 19	We haven't established a causal chain between particle magnets and sea life biotoxicity. We don't know how much of the endocrine disruption in humans is due to marine debris magnets.	NOAA, UH, national medical labs	A paper assigning good numbers on particle accumulation, biotoxicity in marine life, and human endocrine disruption.	C
R11	Quantity (tonnage) of fishing gear vs. quantity lost.	1-3	11-gyre	12-15, 17, 19	There is no quantification of tonnage of gear entering the North Pacific yearly, nor of tonnage lost annually.	Dept of State, NOAA, Pacific basin fishery associations	Reports from all manufacturers of gear entering North Pacific and report from associations on gear lost.	C
R12	Quantify impacts of nets on reef habitat.	2	10	24	Unknown what effects nets have on reefs when they settle and when they are removed. Need this info to quantify damage by nets overall and make decisions on when to remove them.	Midway NWR, NOAA CRED and PMNM	Results that show measurable differences in control vs. net sites and removed-net sites.	B

Focus Area: RESEARCH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed (see table legend)			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost (see table legend)
		Debris Type	Location	Impact Type				
R13	Better understand sources of marine debris.	All	All	All	Prevent debris of unknown origin from entering the ocean.	International community	Comprehensive database with types of debris and their sources.	D - \$3M
R14	Increase networking of marine debris research.	All	11	All	Duplication of efforts, lack of communication.	International community	Centralized database including ongoing and past research to facilitate partnerships.	B
R15	At-sea surveillance of marine debris for collection and tracking.	2	11	12-14, 16-24	Detect and remove nets before they damage reef habitats.	PMNM, NOAA CRED, others	Ability to detect and remove sufficient amount of debris to make feasible (i.e., cost effective)	D - \$1M
R16	Quantify entanglements.	2	9-11	17	Extent of problem is not known, nor is trend.	NOAA PIFSC, State, public	(1) Centralized database combining information from different sources. (2) New targeted studies showing numbers of specific species entangled.	B
R17	Use observers to collect quantitative net/gear loss data.	1-4, 8	11	All	Unknown how much gear is lost per vessel per year.	NOAA observer program, fishing community	Reliable data with gear lost per vessel per year, trackable over time.	A

Focus Area: RESEARCH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed (see table legend)			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost (see table legend)
		Debris Type	Location	Impact Type				
R18	Research on ingestion of plastics and impacts on animals.	4	9-11	18	Unknown what the impacts are on different animals. Certain amount or type may be lethal.	Midway NWR, NOAA, DLNR, academia	We would know if certain debris types are more lethal and target either cleaning or limiting these going into the environment.	B/C
R19	Assess effects of new biodegradable materials on seabird ingestion.	2-4	9	18	Wildlife ingesting new "green" materials that could cause other health problems for seabirds, fish, and invertebrates.	Plastic manufacturers, Dow Chemical, NOAA	--	--
R20	Assess the costs vs. benefits of all activities.	1-6, 8	All	All	Funds are limited, so available funding must be used for actions that provide the most benefit to the problem.	All involved	Higher proportion of funds addressing critical actions.	No cost
R21	Quantify effectiveness of beach cleanups.				Show value of doing or not doing cleanups.			

TABLE LEGEND

Debris Type:

1. Fishing gear – Traps
2. Fishing gear – Nets
3. Fishing gear – Monofilament
4. Plastics
5. Land-based Debris
6. Ocean-based Debris (everything ocean-based except fishing gear)
7. Metal
8. Vessel debris

Location:

9. Main Hawaiian Islands
10. Northwestern Hawaiian Islands
11. North Pacific Ocean

Impact Type:

12. Economic
13. Navigational/Vessel Interaction or Damage
14. Ghost Fishing
15. Human Health and Safety
16. Alien Species Transport
17. Biological – Entanglement
18. Biological – Ingestion
19. Biological – General damage
20. Biological - Fish
21. Biological - Sea Turtles
22. Biological - Marine Mammals
23. Biological - Birds/Seabirds/Shorebirds
24. Biological - Habitat-related

Cost:

- A. <\$50,000
- B. \$50,000 - \$100,000
- C. \$100,000 - \$500,000
- D. >\$500,000

Focus Area: EDUCATION AND OUTREACH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Annual Cost
		Debris Type	Location	Impact Type				
E1	Develop a mechanism for coordinating and distributing core messages across and within organizations.	NA	9-11	12-24	Various messages and information are shared in education and outreach efforts by organizations and agencies. Many times differing information is shared. Consistent core messages and a mechanism to coordinate, create, and distribute those messages would provide for a concise, accurate, and unified message. Get everyone on the same page and speaking the same language.	Anyone who does outreach on marine debris.	Recognition by target audiences of core messages. All partners are using core messages. Random sample of target audience and more than 51% can answer a question on a core message.	A / \$0 In-kind
E2	PSAs on local TV stations and weave a marine debris message into story-line of shows such as Da Braddahs.	NA	9-11	12-24	A difficult target audience would be reached by going through a TV show such as Da Braddahs – getting people to “get it” by laughing at yourself. Would be culturally relevant.	TV station; Tony Silva; Oceanic Cable	Increased awareness of non-involved groups. Local groups increasing their participation in cleanup.	A
E3	Cultural context included within outreach and education messages and materials. E.g.: Use of PSC’s panel display tying culture to marine debris.	2-5	9	12-24	Lack of cultural information in all areas. There is a need for local population to reconnect with cultural values. Bring an awareness of their actions.	Media, educators, govt., Hawaiian groups, halaus, etc.	Increased participation by local groups. Cleaner beaches.	A

Focus Area: EDUCATION AND OUTREACH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Annual Cost
		Debris Type	Location	Impact Type				
E4	Create and disseminate a teacher module for art-based projects that use marine debris as a main material. Age-group specific; all the way up to university workshops.	1-8	9	12-24	Marine debris has a negative connotation. This would turn a negative into a positive through the use of a different mechanism – art.	HI State Dept. of Ed., art institutions, museums	Visible outcome – art sculptures. Measurement of an increase in environmental stewardship.	A-D (printing costs, etc.)
E5	Evaluate the best languages for outreach materials on marine debris.	1-8	9	12-24	Debris is an international problem, especially in Hawai'i.	International agencies, NOAA, Federal, State, Industry, Private	Survey of non-English speaking locals or visitors and ask what messages would be effective	A-B
E6	Good citizen reward for positive environmental behavior.	1-8	9	12-24	Positive way to address research, education, cleanups.	DOE, Churches, City and County, Private businesses, NGOs (e.g. Surfrider), HVCB	How many rewards are given out each year.	A
E7	Foster “sense of place” and responsibility to malama ‘aina in children using Hawaiian cultural values to reinforce the lesson.	All	9	12,15, 17-24	Fostering a sense of responsibility to change patterns of behavior we currently see from adults that abuse and disrespect the land. Hawaiians believed the land was sacred, living, and life-giving.	Hawaiian Studies Dept., Punana Leo, in-school kupuna	Regular surveys by districts where programs were implemented in neighboring schools.	A

Focus Area: EDUCATION AND OUTREACH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Annual Cost
		Debris Type	Location	Impact Type				
E8	Develop signage on impacts of marine debris at public shorelines, marinas, piers, boat ramps, beach parks. Different signs for different users. Message on trash cans to encourage use and inform public.	2-7	9	12-13 16-24	Public needs more easily visible information. Trash cans are visible to locals and visitors. Lack of public awareness on marine debris.	DLNR, NOAA, Hawai'i Tourism Authority, CZM, Hotels	Visitor understanding of signs. Decrease in marine debris.	C
E9	Improve attention to the problem, use drama (gore!) with appropriate caution regarding audience.	All	All	All	With education and outreach materials, include pictures, video of wildlife problems (seabird stomachs, entangled animals, etc.) to get attention to problem.	All education and outreach providers	More attention to problem, reading of educational materials.	No/little added cost
E10	Class in multiple languages on marine debris.	1-8	9-11	12-24	Educates all populations on effects of marine debris, especially with such a diverse population and newcomers continually arriving.			
E11	Kona Brewing Co. special- edition beer awareness campaign on bottles and carrier boxes.	1-8	9	17-24	Would reach a different and possibly new and broader audience with education and outreach messages on marine debris. Provide this new audience with a call to action.	Kona Brewing Co.	Measure the level of awareness of non-involved groups. Measure of participation of local community groups in beach cleanups.	A

Focus Area: EDUCATION AND OUTREACH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Annual Cost
		Debris Type	Location	Impact Type				
E12	Multilingual PSAs in hotel rooms.	1-8	9	3, 15, 19-24	Spread information to tourists and encourage them to clean up after themselves on the beach.	Hotels (Outrigger?) PSAs (Oceanic Cable?)	Number of tourists picking up their trash.	A
E13	Newspapers in Education (NIE) insert – write articles/editorials, develop activities, clearinghouse for information.	1-6	9	12-24	Difficult to reach a statewide audience. This insert could be used as an education supplement at schools and to students. It would be a broad and statewide outreach material that would raise awareness and be a potential call to action.	NIE, Honolulu Advertiser	Beach cleanup participation numbers. How many teachers used them in classrooms.	A
E14	Expand and develop curriculum-based material to HI standards.	All	All	All	Need more exposure to the issue in classrooms. Teachers often don't have time or resources for extra activities. Best if can replace required curriculum.	Curriculum developers, NOAA Marine Debris 101 site	Increased awareness and interest in issue.	A
E15	Message on trash cans to encourage use and inform public.	3, 4, 5	9	17-24	Public needs more easily visible information. Trash cans are visible to locals and visitors.	City and County, art design students	Improved waste management and issue awareness.	A-B

Focus Area: EDUCATION AND OUTREACH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Annual Cost
		Debris Type	Location	Impact Type				
E16	Develop communications training program and/or regular communication training for outreach professionals – give them more tools!!	NA	9	NA	Inconsistent and sometimes conflicting messaging. Poor customer service and public relations with constituents. Lack of communications expertise by outreach personnel.	NOAA,	Rate of trained personnel.	A
E17	Drift web art (display 1 day for 25 feet in diameter).				Transforms garbage into something useful or educational.	Schools, media events.		
E18	Adopt-a-Beach program for schools.				Promote local stewardship and “living classrooms.”			
E19	Target “overlooked” groups (e.g., government grounds keepers).							
E20	Target different educational levels (e.g., service learning for higher education programs).							

Focus Area: EDUCATION AND OUTREACH								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Annual Cost
		Debris Type	Location	Impact Type				
E21	Coordinate county and state interface for disposal fees and roles.				Organize and prevent overlap of jurisdiction and missions.			
E22	Develop interscholastic contests.				Create long-term beach cleanup efforts and awareness.			
E23	Tool to combine beach analysis and cleanup.				Make it easy for teachers to integrate beach cleanups into curriculum.			

TABLE LEGEND

Debris Type:

1. Fishing gear – Traps
2. Fishing gear – Nets
3. Fishing gear – Monofilament
4. Plastics
5. Land-based Debris
6. Ocean-based Debris (everything ocean-based except fishing gear)
7. Metal
8. Vessel debris

Location:

9. Main Hawaiian Islands
10. Northwestern Hawaiian Islands
11. North Pacific Ocean

Impact Type:

12. Economic
13. Navigational/Vessel Interaction or Damage
14. Ghost Fishing
15. Human Health and Safety
16. Alien Species Transport
17. Biological – Entanglement
18. Biological – Ingestion
19. Biological – General damage
20. Biological - Fish
21. Biological - Sea Turtles
22. Biological - Marine Mammals
23. Biological - Birds/Seabirds/Shorebirds
24. Biological - Habitat-related

Cost:

- E. <\$50,000
- F. \$50,000 - \$100,000
- G. \$100,000 - \$500,000
- H. >\$500,000

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
L1	Review permitted municipal storm-water facilities to ensure implementation of management measures, such as maintenance of storm drains and use of BMPs like storm drain filters (NPDES permits, EPA permits regulated by DOH).	5	Statewide	12, 17-24	Make sure facilities are complying with permits and management program, and outreach and education program is where it should be.	EPA, DOH, County, and community	Decrease of trash in near-shore waters. Increase in awareness of the function of storm drains. Increased reef health.	D+
L2	Review nonpermitted municipal stormwater facilities.	5	9		Encourage “permit” type activities – BMPs to the extent possible.	EPA, DOH, County, and community	Decrease of trash in near-shore waters. Increase in awareness of the function of storm drains. Increased reef health.	D+
L3	Inventory potential sources of marine debris or pollutants in stream/river/ahupua’a, such as businesses, industrial areas, residential areas, construction sites, parks.	5	9	12, 15, 19, 24	Proactively identifying and mitigating sources of marine debris before they enter the ocean.	CCH, DOH, EPA, DLNR, NGOs	Decrease amount of marine debris entering the ocean from streams and rivers.	B
L4	Reduce amount of pollutants that enter the stream/river/ahupua’a by working with sources (businesses, industrial	5	9	12, 15, 19, 24	Proactively identifying and mitigating sources of marine debris before they enter the ocean.	CCH, DOH, EPA, DLNR, NGOs	Decrease amount of marine debris entering the ocean from streams and rivers.	C

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
	areas, residential areas, construction sites, etc.) to implement BMPs.							
L5	Decrease bureaucracy and increase curbside recycling to make it easier and convenient for the public to recycle.	4, 5, 7, 8	9-11	12, 15-24	Plastics bottles, cans, plastic bags still end up in storm drains, impacting the environment. Many other states have successful, cost-effective, convenient recycling programs. As an island state we have finite boundaries and landfill capacity, and we have no other options. We should be the leaders and helping other Pacific Islands.	CCH, State, NGOs, Public	Less litter. Increased quantity of recycled goods.	C
L6	Expand the type of pollutants in developing TMDLs and Action Plans to include trash.	4,5	9	12, 17-24	Currently, TMDLs are developed for dissolved and suspended solids. Expand the area of research in developing the TMDL and Action Plan to include trash and marine debris. Los Angeles County has already done this and implemented BMPs to address TMDLs for trash.	EPA, DOH, counties, communities, business, industry	Decrease in trash in near-shore waters.	D+

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
L7	Establish incentives for use of biodegradable products for industries and businesses (land and sea, e.g. cruise ships) as well as disincentives for nonuse.	4, 5, 8	9	12, 17-24	Nonbiodegradable trash is accumulating in the ocean and filling our landfills. Swizzle sticks and straws from sunset cruises are accumulating in near-shore waters.	EPA, DOH, business, industry, community	Reduction of persistent solids in landfills and the marine environment.	D+
L8	Establish incentive for nonuse of plastic bags and disincentives for continued use, through policy reforms.	4, 5, 8	9	12, 17-24	Small plastic bags and beverage bottles accounted for 34.8 percent of all general source marine debris collected in Hawai'i (NMDMP 2007). In Germany, plastic bags are not banned but the public is charged for use. Cost savings resulting from reduced landfill need and cleanup would likely outweigh small additional cost to consumer.	EPA, DOH, business, industry, community	Reduction of persistent solids in landfills and the marine environment.	C
L9	Develop management policies and partnerships with private landowners that own streams or portions of streams.				Stream cleanup and maintenance is hampered by complications over ownership and jurisdiction of streams between private, State, and County. Government faces	EPA, DOH, DLNR, community, NGO	Improved jurisdictional coordination and stream condition.	B

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
					liability issues for cleanup outside its jurisdiction. Private owners are responsible for stream maintenance. If private owners cause problems downstream from lack of maintenance, then they will be liable.			
L10	Enhance stream cleanup and institutionalize long-term maintenance.				Solid wastes accumulate in streams and are transported during rain events to the sea. Land and sea are tightly connected in Hawai'i.	EPA, DOH, DLNR, community, NGO	Reduce trash load to near-shore waters.	D+
L11	Increase enforcement regarding litter, illegal dumping.	5	9	12, 15, 19	Punishes noncompliant people and businesses.	DOH, HPD, EPA, DLNR		C
L12	Partner with recycling campaigns.	6	9	12, 15	Expands fine (negative incentive) or reimbursement (positive incentive) for other types of debris.	Recreational fishing, tour community, regulatory agencies		A
L13	Ensure ample or more appropriate receptacles at access sites, including recycling receptacles.				Encourage public participation in the proper disposal of items that potentially could enter the ocean.	All counties, State	Number of new receptacles.	A
L14	Replicate Volunteer Parks program for beach cleanups and diversify volunteer group types.	6	9	12, 15	Expand existing programs that work to target makai portion of ahupua'a, to prevent land based pollution of ocean.	County or DLNR park volunteer program	Number of volunteers per hour, number of new volunteers, or volume of debris (using sampling areas).	A

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
L15	DOE partnerships/classroom module on beach cleanup and adopt an element from the ahupua'a.	6	9	12, 15				A
L16	Build additional H-Power facilities on all islands to avoid off-island trash transport.				Need to create additional uses such as paving road filler or making plastic/wood compound for trails and benches. To use and recycle marine debris on all islands and reduce dependency on oil.	DBEDT and counties	Number of new plants.	D
L17	Increase incentives for beach cleanup or reward system.	6	9		Provide food to create a sense of community and reward volunteers.	Matson, CCH	Number of sponsored events.	A
L18	Increase collaboration, clarify liability issues, and develop indemnification and insurance clarification.	6	9		Encourage and support long-term grassroots efforts to increase communications between stakeholders.	Federal agencies, CCH	Number of agencies participating.	A
L19	Increase beach cleanup sponsorship with local businesses and tourism industry.	6	9	12	Expand ecotourism from being a spectator to being a participant actively caring for the environment.	Hotels and local businesses (e.g., Matson Container), Hawai'i Tourism Authority, Waikiki Improvement Council	Number of hotels participating.	A

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
L20	Volunteer "working" vacations.	6	9	12		Adventure and recreational tour providers		A
L21	Standardize process for quantifying cleanup results in each county.	6	9	12, 15	Easily estimate cleanup efforts statewide.			A
L22	Clearinghouse for all beach cleanups (Website)	6	9	12	Track and inventory all volunteer beach cleanups.	ICC Program		A
L23	Reporting hotlines (one-stop shop)	6	9		Reduce frustration of public and make disposal easier. (Will require internal organization of service providers.)			A
L24	Eco-Refinery (Midway as a pilot project).				Reduces diesel cost on remote areas.	H-Power	% of garbage burned.	\$600K to \$250K
L25	Plastic compactor for NWHI.				Reduce cost of transporting waste.			
L26	Make marine debris offices "green."	5	9	15?	We need to practice what we preach. If we hold ourselves to a high standard, then general population will follow.	NOAA, State, CCH	Numbers and rates of recycling.	B

TABLE LEGEND

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6. Ocean-based Debris (everything ocean-based except fishing gear)
7. Metal
8. Vessel debris

Impact Type:

12. Economic
13. Navigational/Vessel Interaction or Damage
14. Ghost Fishing
15. Human Health and Safety
16. Alien Species Transport
17. Biological – Entanglement
18. Biological – Ingestion
19. Biological – General damage
20. Biological - Fish
21. Biological - Sea Turtles

Cost:

- I. <\$50,000
- J. \$50,000 - \$100,000
- K. \$100,000 - \$500,000
- L. >\$500,000

Focus Area: LAND-BASED POLLUTION								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				

Location:

- 9. Main Hawaiian Islands
- 10. Northwestern Hawaiian Islands
- 11. North Pacific Ocean

- 22. Biological - Marine Mammals
- 23. Biological - Birds/Seabirds/Shorebirds
- 24. Biological - Habitat-related

Focus Area: BEACH CLEANUP ACTION PLAN								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
B1	Replicate monofilament recovery and recycling project (SE Region) in Hawai'i.	3	9	14	The disposal of monofilament by recreational and small boat fishermen. This is small individually, but adds up. Even responsible anglers who keep their line have nowhere to dispose of it.	NOAA, State, NGOs, BoatU.S.	Amount of line collected. Receptacles used.	A
B2	Organize emergency cleanups.				Address time sensitivity of weather events.	National Weather Service		
B3	Create disposal sites for nets at more harbors, boat ramps.	1-8	9	12-24	As at Pier 38, add net containers at more locations and couple with education signs to recover more debris.	State government, NGOs	More debris recovered and measureable by fishing community.	A
B4	Build H-Power facility on all islands.	1-6, 8	9	12-24	Plastics in landfills do not solve the long-term problem of plastic removal. Conversion to energy without shipping to Honolulu is more cost effective in the long term.	Government agencies, NGOs	More plastic debris converted to energy rather than going to landfills.	A
B5	Support and increase participation for ICC in Hawai'i (Get the Drift and Bag it!). Include media for event sponsors, incentives for volunteers, and increase dive club participation.	All	9	12,13,15, 17,18,19, 20,21,22, 23,24	Lack of awareness in the public. Increase volunteer sense of place. Reduce the amount of marine debris.	CRON, DLNR, schools, agencies	% of volunteers. Miles of beach cleaned. Tons of debris collected.	A

Focus Area: BEACH CLEANUP ACTION PLAN								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness / Success	Cost
		Debris Type	Location	Impact Type				
B6	Increase incentives for beach cleanup or reward system. Best incentive is often food (create a sense of community or experience).							
B7	Main theme for each priority item: how to change mindset about "waste" and develop uses for debris.							
B8	Business partnership/ sponsor cleanups.							
B9	Interscholastic contests.							
B10	Plastic compactor for NWHI.							
B11	Quantify success.							

TABLE LEGEND

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Location:

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Impact Type:

12. Economic
13. Navigational/Vessel Interaction or Damage
14. Ghost Fishing
15. Human Health and Safety
16. Alien Species Transport
17. Biological – Entanglement
18. Biological – Ingestion
19. Biological – General damage
20. Biological - Fish
21. Biological - Sea Turtles
22. Biological - Marine Mammals
23. Biological - Birds/Seabirds/Shorebirds
24. Biological - Habitat-related

Cost:

- M. <\$50,000
- N. \$50,000 - \$100,000
- O. \$100,000 - \$500,000
- P. >\$500,000

Focus Area: REEF CLEANUP								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness	Cost
		Debris Type	Location	Impact Type				
F1	Create/establish a clearinghouse for marine debris that needs removal and information on agencies or organizations that provide training or have equipment or ships available to transport marine debris.	1,2,3,6	9, 10, 11	13, 19	Missed opportunities for organizations/agencies that have transport capabilities in the course of normal operations. Underutilized resources.	U.S. Army, USCG, NOAA, all marine debris partners	Number of times a request is successfully accomplished.	A
F2	Work with fishing clubs to establish marine debris categories in dive tournaments.	3-6	9	14,15,17,18,24	The fishermen want to help but need our assistance, like rubbish removal and/or processing from tournament site. Some are already doing marine debris removal; let's make it easier for them!	NOAA, clubs	No. of tournaments with marine debris category. No. of participants in categories.	A
F3	Establish mechanisms for regular collaboration with fishing and dive clubs, dive tour operators, snorkel rentals (e.g., Snorkel Bob's).	1,2,3,6	9	13,14,15, 20	Even in places as small as Hawai'i, lots of marine debris work is done ad hoc. We need a group that includes all recreational users to improve collaboration across the State.	Clubs, businesses, NOAA, State	Increase in number of nongovernment partners	A
F4	Develop guidelines for underwater line recovery (e.g., NMFS and Volusia Co., Florida)	3	9	14	Many divers remove lead or line while fishing. NOAA SE region published guidelines about how to do so properly and how to organize cleanups of lead and monofilament.	NOAA, clubs, State	Use of guide by clubs and NGOs in beach cleanups. Distribution of guide.	A

Hawai'i Marine Debris Workshop Summary

Focus Area: REEF CLEANUP								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness	Cost
		Debris Type	Location	Impact Type				
F5	Increase capability to respond to debris/nets in MHI waters (hotline, tiered response network, response team for removal, removal training).	1,2,3,6	9	12-17, 19-23	Lack of capacity in the response to marine debris in MHI. Reduce impacts to the environment.	DLNR, Schnitzer Steel, NOAA Marine Debris Program, H-Power	% response to marine debris calls. Response time. Amount debris collected per year.	C
F6	Increase support and capacity for marine wildlife disentanglement.	2	9	17,21, 22	Lack of capacity to respond to entanglement.	NOAA, DLNR, DOCARE, Public	% response time to disentanglement. No. responses to entanglement. % survival of entanglement cases.	C
F7	Establish centralized geospatial database of reports to facilitate response.	All	9	All	Database summary can be used to trigger net recovery response when the number of nets reported at one site reaches a threshold that enables an efficient, economical response to remove them.	All government agencies	Nets in MHI recovered in efficient manner.	Reduces cost of recovery
F8	Take retired performing dolphins out of aquariums and train them to identify and tag nets.	2,3	9-11	12-24	Currently cost-prohibitive to tag nets using vessels and man-power. This would not only get nets tagged, but would give these dolphins a "new job" and get them back into their home environment.	Aquariums, dolphin trainer	Successfully tagged nets.	C-D

Hawai'i Marine Debris Workshop Summary

Focus Area: REEF CLEANUP								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness	Cost
		Debris Type	Location	Impact Type				
F9	Disposal sites for nets at neighbor island harbors and territorial harbors.				Expand Pier 38 effort to other states and territorial harbors.			
F10	Integrate/coordinate efforts with other cleanup groups (algae, beach cleanup, etc.).							
F11	Add debris collection as a prerequisite for obtaining a fishing or recreational tour permit or picnic permit.							
F12	International enforcement and outreach (multilingual) regarding net/gear dumping.							
F13	Require identification on all products that are big offenders indicating that the product is a potential marine debris and should be disposed of appropriately.							

Focus Area: REEF CLEANUP								
ID #	Action(s) Needed	Marine Debris Characteristics Addressed			Problem that Action Addresses	Potential Partners	Measures of Effectiveness	Cost
		Debris Type	Location	Impact Type				

TABLE LEGEND

Debris Type:

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Location:

9. Main Hawaiian Islands
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Impact Type:

12. Economic
13. Navigational/Vessel Interaction or Damage
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17. Biological – Entanglement
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22. Biological - Marine Mammals
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Cost:

- Q. <\$50,000
- R. \$50,000 - \$100,000
- S. \$100,000 - \$500,000
- T. >\$500,000

APPENDIX E

SUMMARY OF PARTICIPANT EVALUATION OF THE MEETING

Hawai'i Marine Debris Workshop - EVALUATIONS

Participant #	1. What is your overall evaluation of today's workshop?	2. Were the workshop objectives clearly presented?	3. Were the presentations helpful?	4. Was there enough opportunity for interaction and participation?	5. Were relevant materials provided?	6. How would you rate the facilitator in terms of knowledge and presentation style?	7. How likely are you to continue being involved in this group on marine debris priority actions?	8. What aspects of the workshop did you find the most useful?	9. What aspects of the workshop were the least useful?	Additional comments
1	5	Y	2	2	Y	5	5	The group brainstorming was very useful. It's great to hear the perspectives from all of the various expertise in the room.	There was a lack of understanding or discussion on some of the specific actions, which made it difficult to vote on the actions.	I think this workshop is a great first step to developing a marine debris plan. I look forward to continued development and prioritization.
2	4	Y	2	2	Y	4	5	networking	n/a	Need to involve legislation in this issue. County mayors, etc.
3	4	Y	2	2	Y	4	4	the action development		
4	4	Y	2	not sure - unable to attend whole conference	Y - but would still like to get director's ppt presentation and/or notes	4	4	Presentations of various organizations and programs		I'd like contact info. for presenters and attendee/contact list would be helpful to have a response flow chart/phone tree if various debris is spotted in a specific region...who to call for response/cleanup action.

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5	5	Y	2	2	Y	5	5	Meeting with people that are concerned with marine debris and the action plans to "rid" or reduce marine debris	None	
6	4	Y	2	2	Y	5	5	discussions		
7	5	Y	2	2	Y	5	5	the action plan process		
8	5	between yes and no	2	2	Y	5	5	Achieving consensus among diverse organizations.	I didn't have a clear definition of the workshop's structure and goals going in.	
9	5	Y	1	2	Y	5	5	Learning all of the things that are presently being done on marine debris and meeting people in the community.	Extra material in some presentations	Very good! Thanks!
10	5	Y	2	2	Y	5	5	Gathering with all those involved in marine debris to brainstorm.	None	
11	4	Mostly	2	2	Y	5	4	Brainstorming session		The room was horrible! Temperature and the post! Parking options were abominable!

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12	4	Y	2	1.5	N - ___? like this is now being addressed	5	5	Good cross section of interests although there were some interests not represented.	The room and location were not conducive for this type of meeting -- parking was a big problem and there needed to be a bit more time to go over focus.	
13	4	Y	2	2	Y	4	4	focus areas - development/actions		Keep up the momentum and continue to move forward. Great start! More convenient place.
14	3	Y	3	2	Y	4	5	as a group discussing and expanding on the issues	The process of prioritizing issues could be improved. Lots of ideas may have been lost between the group brainstorming and the selection of the top 6 per focus area. There should have been a step of consolidating and expanding and understanding the issues.	It would be nice to have short abstracts (paragraph) of all the current MD projects to supplement the presentations.
15	5	Y	2	2	Y	5	4	Information from many different people with different backgrounds.	--	

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16	4	Y	2	2	Y	5	5	Networking -- hearing what other people were working on.	Expanding on ideas that weren't fully developed. Too much time spent talking about things we don't know the answers to.	Fun to be in a "think tank." Room was very cold though.
17	5	Y		2	Y	5	5	Information sharing from most sectors forming synergistic action items / collaborative nature of generating solutions.		Thanks for including artist's perspective at the table! Perhaps from a slightly different point-of-view, but have energy + ideas to offer. Mahalo.
18	5	Y	2	2	Y	5	4	Presentations on what Coast Guard and NOAA are doing at sea to collect marine debris (large-scale). Also the group activity to list actions under each issue topic.		
AVG	4.4	--	2.0	2.0	--	4.7	4.7			

Scale Used for Response to Questions

Questions # 1, 6, & 7: 1=Poor; 5=Excellent

Questions # 3 & 4: 3=Too Many; 2=Just Right; 1=Not Enough