



NOAA Fisheries, Coral Reef Ecosystem Division Marine Debris Program, Honolulu Laboratory

SYNOPSIS OF THE 2003 MARINE DEBRIS FIELD SEASON

OVERVIEW AND GOALS

In 2003, a multi-agency effort to remove derelict fishing gear (a type of marine debris) from ecosystems within the Northwestern Hawaiian Islands (NWHI) was successful in its seventh year of operations. Led by NOAA's Coral Reef Ecosystem Division (CRED) of the Pacific Islands Fisheries Science Center, the four month field effort employed sixteen divers aboard two chartered vessels (F/V Ocean Fury and M/V American Islander) and resulted in the removal of over 122 tons of derelict fishing gear. The main objectives for the 2003 marine debris field season were:

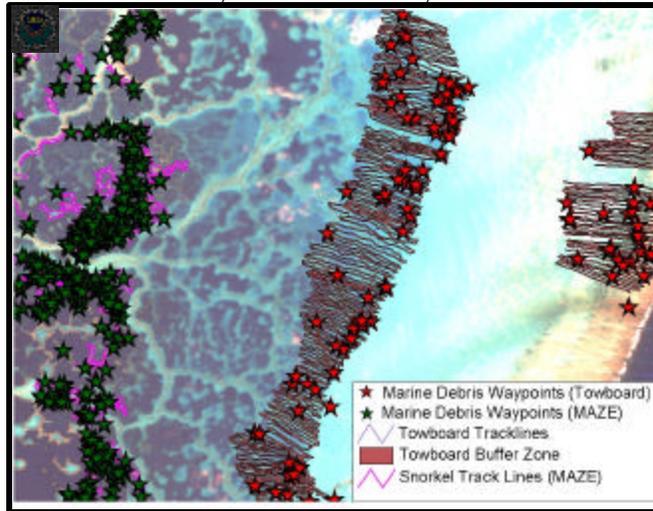
- To assess and remove derelict fishing gear from the reefs and beaches of the Northwestern Hawaiian Islands. Operations were conducted at Pearl and Hermes Atoll, Kure Atoll, Midway Atoll, Lisianski, Laysan, Maro Reef and French Frigate Shoals.
- To monitor debris accumulation in specific sites labeled High Entanglement Risk Zones (HERZ) for Hawaiian monk seals (*Monachus schauinslandi*).
- To conduct short term ecological research projects including a ecological succession study of algal communities associated with net removal scars, a study of growth rates of different corals in association with marine debris, a study of internal reef currents using a shallow draft drifter buoy, a baseline population study of the black-lipped pearl oyster (*Pinctada margaritifera*) and the crown-of-thorns sea star (*Acanthaster planci*), and a coral recruitment study using settlement plates.
- To support the filming efforts of the Japanese Television Workshop Company and the Ocean Futures film production company in shooting footage of marine debris removal operations in order to highlight the problems associated with marine debris in the NWHI.
- To cut up the derelict fishing gear and recycle it for H-Power, with the help and donated time of a non-governmental agency--Hawaii Metals Recycling, Inc.,

2003 MARINE DEBRIS FIELD SEASON

The 2003 marine debris field season began at Kure Atoll for the M/V American Islander and at Lisianski Atoll for the F/V Ocean Fury where the HERZ of each respective location was surveyed using standard manta towboard protocols. The majority of the 2003 field season was spent surveying the inner reticulated reefs (MAZE) at Pearl and Hermes due to a high density of derelict fishing gear in those areas. The back reefs and sand margins inside the fringing reef at

Pearl and Hermes were also assessed in a number of locations. The sand margins were expected to have low densities of net, but were found to have an unexpected number of large nets partially buried in the sand. The HERZ was surveyed using standard manta towboard protocols, while other sites used a combination of towboard and snorkel surveys. The recovery of derelict fishing gear relied primarily on freediving, while deeper or more complicated nets required the use of SCUBA.

An estimated 95% of the back reef, the emergent reef, and some deeper areas at Midway Atoll were surveyed during the 2003 field season using standard swim/towboard or reef walking protocols. Land debris from Sand and Eastern Island was collected in cooperation with the U.S. Fish and Wildlife Service of Midway. While on Midway, the marine debris team also supported the filming efforts of two professional film companies. The Japanese Television Workshop Company shot footage of debris removal operations and life aboard the two contract vessels to produce a half hour program on ecological issues. The Ocean Futures Society, an organization led by Jean-Michel Cousteau, filmed debris removal operations for an upcoming documentary about the Northwest Hawaiian Islands.



IKONOS satellite image illustrating 2003 marine debris recovery efforts within the MAZE, sand margin and back reef environs at Pearl and Hermes.

Marine debris that washed up on land was collected at the following locations: French Frigate Shoals, Laysan, Lisianski, Kure, Midway and Pearl and Hermes Atolls. The combined efforts of 16 divers and two platforms resulted in over 122 tons of derelict fishing gear being removed from the coral reefs and beaches of the NWHI in 2003.

For the second year in a row, Hawaii Metals Recycling, Inc., donated their services to cut up the recovered debris, allowing it to be incinerated by H-Power (Honolulu Power) and converted to electricity for the City and County of Honolulu. This company, whose normal focus is recycling scrap metal, was awarded the Hawaii Audubon Society's Corporate Conservation Award for their contribution. As a result of their efforts, it has been estimated that the debris from the 2003 cleanup will be able to power approximately 43 average households in Hawaii for a year.

In August, four Coral Reef Early Warning System (CREWS) buoys located at Kure, Pearl and Hermes, Maro Reef, and French Frigate Shoals were replaced, along with a Sea Surface Temperature (SST) buoy at Necker. These buoys will continue to provide data regarding environmental variables (sea surface temperature, weather conditions, etc.) to CRED over the next several years.

During the field season at Pearl and Hermes, two green sea turtles were found entangled in derelict fishing gear. The debris divers carefully removed the sea turtles from the net and they appeared to have no major injuries or impediments to movement. On several occasions, debris

divers noted monk seals and green sea turtles basking on derelict fishing nets and/or investigating nets. Protected Species Division (PSD) personnel reported sixteen incidents of



monk seal entanglements. Eight of the entangled monk seals were released uninjured and 5 escaped uninjured. Two of the entangled seals were released or escaped injured, while the fate of one was unknown. Additionally PSD personnel from Pearl and Hermes successfully disentangled a Hawksbill turtle.

Hawksbill sea turtle entangled in derelict fishing gear on beach of Pearl and Hermes. Photograph by Chad Yoshinaga.

TIMELINE OF OPERATIONS

- 05/14/03 Lisianski practice towboard protocols (American Islander (AI) and Ocean Fury (OF)).
- 05/15/03-05/16/03 Transit (AI).
- 05/15/03-05/17/03 Lisianski HERZ (OF).
- 05/17/03-05/19/03 Kure HERZ and exploratory towboard surveys (AI).
- 05/18/03 Transit (OF).
- 05/19/03 Begin operations at Pearl and Hermes (OF)
- 05/20/03-07/15/03 Pearl and Hermes towboard and swim surveys: HERZ, MAZE, back reef, and sand margins (AI and OF).
- 07/16/03-08/09/03 Midway towboard and swim operations. AI divers housed at Midway PSD house, while AI transits back to Honolulu, with PSD camp pickups at Kure, Midway, Pearl and Hermes, Lisianski, Laysan, and French Frigate Shoals. OF at Midway for daily operations.
- 08/10/03-08/18/03 Return to Pearl and Hermes. Towboard and swim surveys. MAZE and sand margins targeted (AI and OF).
- 08/19/03 Midway pickup CREWS buoys (AI and OF).
- 08/20/03 Transit (AI and OF).
- 08/21/03 Lisianski pickup land debris (AI and OF).
- 08/22/03 Laysan pickup land debris and American Islander anchor recovery (AI and OF).
- 08/23/03 Maro Reef CREWS buoy replacement and exploratory surveys conducted (AI and OF).
- 08/24/03 Transit (AI and OF).
- 08/25/03-08/26/03 French Frigate Shoals CREWS buoy replacement, pickup land debris (AI and OF).
- 08/27/03 Necker Sea Surface Temperature (SST) buoy deployment (AI and OF).

- 08/28/03 Transit (AI and OF).
- 08/29/03 Arrive Honolulu 0930 AI and 1400 OF.

HERZ AREA COVERED

• Kure Atoll	Area covered	0.91 km ²
	Number of Net Sites	67 nets
	Weight of debris recovered	452 kg
• Pearl and Hermes Atoll	Area covered	0.95 km ²
	Number of Net Sites	16 nets
	Weight of debris recovered	676 kg
• Lisianski Island	Area covered	0.74 km ²
	Number of Net Sites	4 nets
	Weight of debris recovered	209 kg

DEBRIS REMOVED BY WEIGHT

• Kure Atoll	Land Debris	775 kg	(1708 lbs)	
	HERZ	452 kg	(997 lbs)	
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	Total	1,227 kg	(2,705 lbs)	
• Pearl and Hermes Atoll	Land Debris	1,207 kg	(2,660 lbs)	
	HERZ	676 kg	(1,490 lbs)	
	Reef	81,147 kg	(178,849 lbs)	
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Total	83,030 kg	(182,999 lbs)		
• Midway Atoll	Land Debris	3,958 kg	(8,724 lbs)	
	Reef	14,662 kg	(32,317 lbs)	
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Total	18,620 kg	(41,041 lbs)		
• Lisianski Atoll	Land Debris	3,380 kg	(7,450 lbs)	
	HERZ	209 kg	(460 lbs)	
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Total	3,589 kg	(7,910 lbs)		
• Laysan Atoll	Land Debris	2,155 kg	(4,750 lbs)	
• French Frigate Shoals	Land Debris	2,246 kg	(4,950 lbs)	
		Total Weight 2003:	110,867 kg (244,355 lbs)	
			(122.18 tons)	
		Total Weight 1996-2003:	330 tons	

Marine Debris Multi-Agency Partners

NOAA's Coral Reef Ecosystem Division
NOAA's Coral Reef Conservation Program
National Ocean Service
Pacific Sea Grant College Programs
Hawaii Metals Recycling, Inc.
JIMAR
US Fish and Wildlife Service
Hawaii State DBEDT
City and County of Honolulu
Hawaii DLNR
Hawaii Coastal Zone Management
US Department of State
Ocean Conservancy
Honolulu Waste Disposal
US Coast Guard
Western Pacific Regional Fishery Management Council
Hawaii Audubon
Covanta Energy
Hawaii Humpback Whale National Marine Sanctuary
Hawaii Ocean Safety Team
US Navy
Natural Resource Consultants, Inc.
Ocean Futures Society
Victory Fishing Gear
Groundfish Forum, Inc.