

Aquatic Invasive Species Program

2014 Accomplishment Report



Department of Land and Natural Resources

Division of Aquatic Resources



Aquatic Invasive Species Program



Kāne`ohe Bay Invasive Algae Control Super Sucker and Urchin Hatchery

- Cleared over 18,000 lbs. of algae on 3.3 acres of reef
- Stocked over 110,000 urchins in 2014, totaling 270,000 urchins outplanted
- Hatchery expansion with 20 new grow-out tanks
- Supplied urchin larvae and technical support to Oceanic Institute for a second urchin facility



Kāne`ohe Bay Ecosystem Monitoring

- Developed the “Snap-Assessment” rapid survey methodology and surveyed and mapped over 40 patch reefs
- Developed a reef restoration prioritization model based on coral and invasive algae cover
- Established a new reef monitoring protocol
- Completed baseline assessments for selected reefs



Ballast Water & Hull Fouling Coordination

- Completed an 18-month biofouling study and drafted paper on research, vessel husbandry practices and policy options
- Ballast water rule amendments cleared legal review
- Facilitated and influenced regional management issues via chairing the Western Regional Panel on Aquatic Nuisance Species Coastal Subcommittee



Rapid Response

- Led State-wide monitoring effort for coral bleaching event
- Responded to Japanese tsunami debris reports and sampled potential AIS for analysis



Outreach

- Feature articles in Hana Hou magazine and Star Advertiser
- Partnered with Eyes of the Reef citizen science program
- Participated in community events, science fairs, professional conferences, & workshops

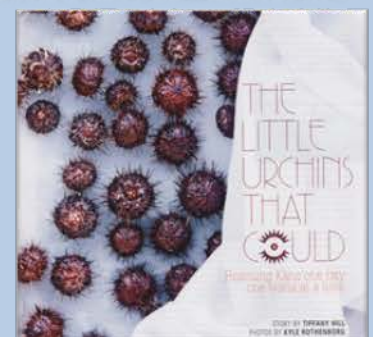


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Introduction

The Division of Aquatic Resources (DAR), Aquatic Invasive Species (AIS) Program is committed to managing AIS threats to Hawai'i with the goal to minimize the ecological, economic, and human health impacts of AIS through the prevention and management of AIS introduction, expansion, and dispersal into, within and from Hawai'i (State of Hawai'i Aquatic Invasive Species Plan 2003). The DAR, AIS program's main focus areas include:

- Invasive algae management and control in Kāne`ohe Bay, O`ahu.
- Managing and operating the sea urchin hatchery.
- Ballast water and hull fouling data gathering and policy development.
- Prevention of AIS introduction and early detection.
- Ecosystem monitoring .
- Rapid response to AIS introductions, marine debris, disease outbreaks, coral bleaching, and other threats to Hawai'i's coral reefs.
- AIS focused outreach, education, and community engagement.
- AIS policy development.
- Coordination and collaboration with researchers and partners.

This year (2014) has been very productive for the AIS Program, with a broad range of accomplishments including management and control work conducted in Kāne`ohe Bay, aquatic invasive species monitoring, hull fouling baseline data collection, community engagement, participation in state, national, and international conferences and workshops, and rapid response to one of the largest coral bleaching events on record in Hawai'i's. It has also been a year of transition for the Super Sucker team personnel from contract employees (RCUH-SSRI) to State Civil Service. This report summarizes the accomplishments of the AIS program in 2014 and lays out the program's direction for 2015.

Invasive Algae Control: Super Sucker, Sea Urchin Hatchery, Monitoring

Overview

Invasive algae control is one of the primary management priorities of the DLNR-DAR aquatic invasive species program. The proliferation of introduced invasive algae throughout Kāne`ohe Bay poses a major threat to coral reef ecosystems. As a result, extensive invasive algae management has been carried out over the past decade. This effort includes mechanical removal of algae by the "Super Sucker" underwater vacuum system, a sea urchin biocontrol hatchery, and ecosystem monitoring.

2014 Key Accomplishments

- Cleared 3.3 acres of coral reef and removed 24,000 lbs of algae.
- Completed Super Sucker algae removal on Reef 29 and began clearing Reef 10.

- Outplanted 111,000 hatchery raised juvenile urchins to reefs in Kāne`ohe Bay, totaling 270,000 urchins outplanted since inception.
- Outplanted sea urchins to six invasive algae control reefs.
- Provided urchins for ongoing research collaborations with Chamanade University, The Waikiki Aquarium, USGS, and the University of Hawai`i.

Reef	Urchin Stocking	Pounds Removed	Acres Cleared
10	23,700	6,000	2
19	4,800	--	--
26	2,350	--	--
29	76,463	18,000	1.3
44	2,000	--	--
54	2,000	--	--
Other	428	--	--
TOTAL	111,741	24,000	3.3

2014 Activity Highlights

Hatchery Improvements and Advancements

- Expanded urchin hatchery by beginning the installing of 20 new grow-out tanks. The expansion is expected to double production by 2016.
- Supplied urchin larvae and technical support to Oceanic Institute to help jump-start a second urchin hatchery facility.
- Completed advances to increase urchin larval room capacity.

Mitigation Bank

- Assisted on the completion of a draft mitigation bank prospectus for the proposed Aquatic Umbrella Mitigation Bank.
- Began invasive algae control on reefs selected for the mitigation bank.

Marker 12 Reef Restoration Plan

- Completed a draft work plan for invasive algae control on Marker 12 Reef, proposed for initiating in 2016 as part of the Cape Flattery ship grounding settlement.

Kāne`ohe Bay Action Plan

- In collaborating with The Nature Conservancy, a Kāne`ohe Bay Action Plan is being developed and expected to be completed in early 2015. The plan will lay-out the priorities, goals, and objectives for managing invasive algae in Kāne`ohe Bay.

Kāne`ohe Bay Ecosystem Monitoring

- Conducted monitoring for the NOAA Restoration Grant Monitoring on Reefs 26, 27, 28, and 29.
- Monitoring results show that invasive algae control efforts have been successful in maintaining low levels of invasive algae regrowth for over two years.
- Developed the Snap-Assessment monitoring protocol. The survey methodology is a rapid, large scale GIS based monitoring methodology.
- Surveyed over 40 patch reefs in Kāne`ohe Bay using the Snap-Assessment methodology.

- Used the snap-assessment data to prioritize invasive algae control efforts in Kāne`ohe Bay.
- Developed a new protocol for monitoring mitigation bank reefs and completed a baseline assessment of 10 patch reefs.
- Completed a baseline assessment for the Waikiki coral outplanting mitigation bank site.

Staff

DLNR-DAR completed the hiring of the Civil Service AIS team including an Aquatic Biologist IV, Aquatic Biologist III, and four Fishery Technician IV's.

Grants

The AIS team received a grant from the Hawai`i Invasive Species Council (HISC) for \$28,000 to fund Americorp interns, site visit travel to neighboring islands, and algae removal and monitoring equipment.

2015 Priorities

- Complete algae removal and sea urchin stocking of mitigation bank reefs.
- Increase sea urchin productivity with the newly installed grow-out tanks.
- Continue innovation in the sea urchin hatchery operation.
- Complete a five-year action plan for the DAR AIS program expanding efforts beyond invasive algae control.
- Increase support for neighboring island AIS issues.
- Complete Cape Flattery settlement and the Marker 12 reef work plan.
- Complete the Kāne`ohe Bay Action Plan.

Ballast Water and Hull Fouling Coordination

Overview

The Ballast Water and Hull Fouling (BW&HF) Coordinator is a collaborative position between the Pacific Cooperative Studies Unit (PCSU), and the Department of Land and Natural Resources (DLNR), Division of Aquatic Resources (DAR). The position is jointly funded by grants from the Hawai`i Invasive Species Council and the US Fish and Wildlife Service. A critical supporting project was funded by the Hau`oli Mau Loa Foundation. Support was also provided by the Coordinating Group on Alien Pest Species (CGAPS) legal fellow.

The BW&HF Coordination program is one of DLNR's primary programs for protecting Hawai`i's marine resources from invasive species threats. The majority of introduced marine species have been brought to Hawai`i by the shipping industry via ballast water and biofouling vectors. The focus of the BW&HF coordinator throughout the past three years has been BW&HF policy development, data gathering, and engagement with regional BW&HF policy makers, managers, and stakeholders.

2014 Key Accomplishments

- Attorney General's office approved amendments to DLNR's ballast water rules (Hawai`i Revised Statutes 13-76) to bring alignment with international and federal standards. In 2015 DLNR plans to consult on and finalize the amendments.

- An 18 month biofouling research project to support policy development was finalized. The project included (A) data gathering of boat and shipper behaviors as it relates to vessel biofouling management (n=185) (B) completion of vessel sampling in dry dock (n=2)
- Together with the Smithsonian Environmental Research Center, a draft discussion paper was developed that assessed historical patterns of marine invasive species introductions in Hawai`i, vector patterns, hull husbandry practices, research and monitoring priorities and recommendations for management/policy development.
- Created the impetus for regional marine invasive species policy development and facilitated agreement to a regional management plan for the states of Alaska, Washington, Oregon, California and Hawai`i and the province of British Columbia .

2014 Activity Highlights

Ballast Water (BW) Policy

- Continued to engage with the First Deputy, DAR administrator and Pacific states (CA, WA & OR) on the implications for state BW rules with the proposal of an overarching federal rule by the United States Coast Guard (see s2094).
- Two BW compliance technologies were tested in Honolulu .

Biofouling Policy

- DAR hosted a New Zealand marine biosecurity sharing session for agencies across the Pacific US states, British Columbia and Hawai`i.
- Continued strategic engagement with the Californian State Lands Commission, Western Australian Department of Fisheries, New Zealand Ministry of Fisheries and Australian Government Department of Agriculture on their biofouling requirements.
- Engaged maritime stakeholders on the marine biosecurity risks of ship in-water cleaning at a meeting of the Hawai`i Ocean Safety Team.

Regional Working Groups

- Continued to Chair the Coastal Subcommittee of the Western Regional Panel on Aquatic Nuisance Species (WRP). Set regional priorities for marine invasive species management activities and policy development.
- As Chair of the WRP Coastal Subcommittee, organized and facilitated a workshop to address the invasion risk of tunicates across the western United States. Representatives include the Pacific US states and British Columbia. The group identified the need for a regional marine invasive species management plan to address the continued spread of marine invaders between jurisdictional boundaries.
- Established an AIS advisory group with local agencies to help guide the direction of the Ballast Water and Hull Fouling Program and strengthen strategic partnerships.
- Ongoing active representation of DAR-DLNR at meetings, strategic planning and legal prioritization activities of the Hawai`i Invasive Species Council and CGAPS.
- Continued representation of Hawai`i's progress and concerns at the Pacific Ballast Water Group, California State Lands Commission Technical Advisory Group, WRP annual meeting and the Washington State Ballast Water Working Group meetings.

Partnerships and Collaborations

- Built a partnership with Governors State University (Chicago) for commercial port monitoring of metazoan species in Hawai`ian ports. The project will inform predictive risk models for vessel-mediated marine bioinvasions throughout the world.
- Collaborated with the “Ocean Tipping Points” project on inclusion of 2.5 years of data on landings of biofouled Japanese tsunami marine debris in Hawai`i.
- Assisted with the development of a risk assessment tool to predict consequence of marine invasions in Hawai`i and support pragmatic decision making for resource managers.

Japanese Tsunami Marine Debris (JTMD)

- Led aquatic invasive species (AIS) response to seven landings of biofouled marine debris on Oahu. Decontaminated and sampled biofouling for analysis.
- Established partnership with Pacific Wildlife Foundation for debris monitoring in Au`au Channel .
- Engaged in and supported DLNR’s internal JTMD response and planning group.
- Participated in NOAA’s Marine Debris Workshop for 2-3 year strategic planning.
- Met with a visiting representative of the Plastic Soup Project, Netherlands .

Outreach and Community activities

- Volunteered with the Kahoolawe Island Reserve Commission on a 4 day land restoration trip.
- Co-organized stall at the annual Invasive Species Awareness week at the Capitol.
- Moderated Marine Invasions session at Hawai`i Conservation Conference and delivered two presentations.
- Gave career presentation to marine biology students at Hawai`i Pacific University.
- Represented DLNR at the “NOAA 3 years on” JTMD regional conference.
- Completed DLNR volunteer leadership training.
- Represented the state of Hawai`i at the 17th International Congress of Marine Corrosion and Fouling in Singapore .

Staff

- Assisted with the creation of a temporary State-wide JTMD Coordinator position.
- Assisted with the hiring of the first civil service DAR-AIS Coordinator.

Grants

- Secured funding for 2014 and 2015 from the Hawai`i Invasive Species Council and the US Fish and Wildlife Service to support program needs.

2015 Priorities

- Complete public consultation on Hawai`i’s ballast water rule amendments and obtain stakeholder support for the rule.
- Draft vessel biofouling policy options. Obtain DLNR approval on the recommended policy option. Begin public consultation on a final policy and rule drafting.
- Begin the policy development process for the marine invasion risks associated with vessel in-water cleaning. Contract the Smithsonian Environmental Research Center to complete a study on the availability of cleaning technologies, the risks of cleaning methods, the frequency of cleaning that occurs in Hawai`i and associated risk, and recommendations for management. DLNR will complete the data gathering portion on the volume and nature of vessel in-water cleaning that occurs in Hawai`i.

- Complete scoping of a Regional Marine Invasive Species Management Plan and begin its development with partners across the western US coastal states and British Columbia.
- Assist with follow-up surveys of sites where biofouled Japanese tsunami marine debris landed across Hawai'i. Coordinate data sharing with marine invasion experts to estimate the likelihood of species establishment and consequence.

Rapid Response

Overview

The DAR AIS team serves as the main rapid response dive team to respond to unusual events including invasive species reports, coral disease, coral bleaching, ship groundings, and urchin disease. In addition to field components, the team also provides survey methodology, analysis, and management recommendations.

Key Accomplishments

- Responded to the largest coral bleaching event on record in Hawai'i.
- Developed a coral bleaching survey methodology.
- Responded to an urchin disease outbreak on Oahu.
- Participated in a Rapid Response Learning Exchange .

Outreach and Community Engagement

Overview

The AIS team participated in a variety of outreach and community engagement events in 2014. Events were aimed towards local community members, resource managers, researchers, students, and the general public. The team also worked to update outreach materials in order to better communicate AIS issues to Hawai'i's residence.

Key Accomplishments

- Presented at Hawai'i Conservation Conference, Coral Reef Task Force Meeting, Hawai'i Pacific University Marine Science Symposium.
- Featured articles in Hana Hou magazine and The Honolulu Advertiser.
- Participated in outreach events including The Bishop Museum Science Alive Night, Windward Mall Earth Day Celebration, Kāne`ohe Key Project Open House.
- He'eia Pier Sign unveiling.
- Provided Eyes of the Reef training lectures pertaining to AIS identification.

Staff

- Hired AIS Fishery Technician, Jason Mehlinger to coordinate AIS outreach activities.

Grants

- Received a \$4000 grant to fund printing of outreach materials.

2015 Priorities

- Redesign outreach materials to improve messaging and ascetics.
- Continue to engage community groups, resource managers, rule makers, students, and the public regarding AIS issues.