## Accomplishment Report 2023

Department of Land and Natural Resources

# Division of Aquatic Resources

January 2024



### Aloha mai kākou

It's time to close out another year and reflect upon our work, partnerships, growth, challenges, and accomplishments; as well as define the goals for the coming year.

I would like to begin by acknowledging the ongoing environmental crisis that is currently unfolding in Lahaina and Kula as a result of the catastrophic wildfires on August 8, 2023. It's difficult to talk about DAR's successes of 2023 considering the enormous tragedy Hawai'i experienced in Lahaina and Kula on Maui and in Kohala on Hawai'i Island. The fires still weigh heavy on us all and the extent of the social, economic, and ecological impacts are yet to be realized, especially on Maui. The strength and resilience of the people of Lahaina is an inspiration and in these difficult times we are reminded of the importance of community. I am extremely proud of our DAR-Maui 'ohana who have become a pillar in the Maui community and continue to play a leading role in the recovery effort.

In 2023, we welcomed a new DLNR Leadership team with the appointment of a new chair of the Board and Land and Natural Resources (BLNR), Dawn Chang and new deputy chair of the BLNR, Laura Ka'akua. We also welcomed the re-appointment of Deputy Chair of the Commission on Water Resource Management, Kaleo Manuel. Dawn, Laura, and Kaleo hit the ground running, quickly establishing their priorities for the Department and it has been great working with them to carry out their vision which places a major emphasis on community engagement and partnerships, a vision that aligns with the place-based, community-centric direction that DAR has been striving towards over the past few years. DAR also made important headway with the Holomua Marine Initiative (previously the Holomua Marine 30x30 Initiative) this year. The initial rollout of the then Holomua Marine 30x30 Initiative and the subsequent dropping of the 30x30 goal and slogan came as a shock to some partners and community members who expressed mixed reviews on the decision. However, through numerous discussions and extensive outreach, we have been able to provide clarity and quell many of the concerns that were initially raised. As we close out 2023, we have a new defined vision and goal for the Holomua Marine Initiative which, I feel, are better aligned with the goals and priorities of Hawai'i's communities and stakeholders:

#### Vision

l ola nā kai o Hawai'i i ka nui i'a. So the waters of Hawai'i thrive with abundance.

#### Mission

To implement a comprehensive strategy focused on effectively managing nearshore marine areas around each main Hawaiian island by developing and carrying out management frameworks that place an emphasis on community participation, cultural relevance, and maximized effectiveness in all stages of management. This was probably the most ambitious year DAR has ever pursued in terms of rulemaking with five rulemaking proposals initiated in 2023, three of which were approved and took effect within the calendar year and two of which are scheduled to go before the BLNR for final approval in January 2024. The rulemaking proposals focused on improving the sustainability of Hawai'i's nearshore fisheries by establishing and/or updating statewide rules for some herbivorous fish species essential to the health and resilience of our coral reefs, revamping and expanding our licensing program by updating outdated permit and license fees and establishing a nonresident recreational fishing license, a commercial marine vessel license, and a commercial marine dealer license, pursuing the designation of the Kīpahulu Community-Based Subsistence Fishing Area, a community-led effort decades in the making, and updating the rules for the Molokini Shoal Marine Life Conservation District and the statewide dayuse mooring program in collaboration with the Division on Boating and Ocean Recreation. In addition, we pursued rules for the implementation of the Ocean Stewardship User Fee that was created through statute by the Hawai'i State Legislature in the 2021 legislative session. The updated and new fees will contribute towards a reliable and sustainable financial framework to better support aquatic resources conservation within the State.



DAR staff from all islands convened in-person for the first time in over four years to kick off DAR's five-year strategic planning effort. It was an inspiring two-day endeavor where DAR staff worked together in defining goals and objectives in furtherance of DAR's collective vision of thriving, abundant waters that will be DAR's focus over the next five years. The all-hands meeting was also a great chance for DAR staff to reconnect with colleagues and meet the new staff who have joined the team.

DAR also took great strides this year in terms of redefining our organization and leadership structure. After more than a decade in the works, DAR finally successfully completed a reorganization of the Division. The new organization chart created new programs: The Mitigation, Aquaculture, Resilience, and Restoration Branch (MARR), the Fisheries Branch, and the Ecosystem Management Branch, in addition to our five district offices on Hawai'i Island (Hilo and Kona), Maui Nui, O'ahu, and Kaua'i Nui. Further, DAR successfully filled the lead biologist positions for each of the five district offices this year adding to the Division Leadership Team.

I highlight a few of DAR's major accomplishments from 2023 below in addition to our 2024 goals. Mahalo to all of the DAR staff whose work is highlighted below. Also, mahalo nui to our agency, nonprofit, and community partners, as well as to the broader Hawai'i community to whom we serve and for whose benefit we hold and manage the aquatic resources of the State. I am looking forward to the great things ahead in 2024.

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Sincerely,

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Brian Neilson, DAR Administrator





















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# DAR Accomplishments Administrative

## 2023 Hawai'i Legislative Session



### Other Highlights

- Completed a major DAR Reorganization that was in the works for the past decade and submitted a second reorganization to establish new civil service positions.
- Filled 20 civil service positions.
- Kicked-off the planning process for the 2025-2030 DAR Strategic Plan with a two-day all staff workshop.

- Passed a resolution designating Hawai'i's coral reefs as critical natural infrastructure and strongly supporting nature-based solutions such as coral reef restoration for risk reduction.
- Consolidated three DAR programs into a single program to streamline budgeting and fiscal administration.
- Received \$4.85 million CIP for Anuenue Fisheries Research Station Facility maintenance and upgrades .
- Designated limu kala (Sargassum echinocarpum) as the official Hawai'i state limu.
- Passed a resolution requesting DLNR to conduct a study on Marine Life Conservation District Designations.
- Passed a resolution urging DLNR to minimize human interaction at certain locations during coral spawning events.
- Passed a resolution urging DLNR to protect Hawai'i's waters and resources by prohibiting seabed mining.
- Creation of new Administrative Specialist and two Aquatic Biologist positions.
- Received a \$14,790,000 appropriation for various operating costs and renovations, improvements, acquisitions, motor vehicles, equipment and appurtenances.

# DAR Accomplishments Administrative

### **New Funding**

- National Fish and Wildlife Foundation Coral Reef Conservation Fund 2023 awarded for "What's the use of emergency coral reef restoration: Honolulu Harbor, HI Case Study" – \$80,533.
- National Marine Sanctuary Foundation Capacity Building to Implement Coral Restoration Action Plans in the US Pacific Islands grant awarded for "Statewide Coordination using the Hawai'i Coral Reef Strategy Makai Restoration Action Plans" – \$344,918.
- U. S. Fish and Wildlife Service Zoonotic Disease Initiative, States and Territories grant awarded for "Marine Wildlife Zoonoses: Improving Biosafety and Increasing Diagnostic Capacity in the State of Hawai'i and the Pacific Island Territories" – \$775,000.
- Received a 2023 HISC Award to support the Ballast Water and Biofouling team (\$78,000). AIS team received three awards from the 2023 REPI Challenge to 1) investigate eDNA in harbors (\$168,000), 2) fund a Rapid Response Coordinator (\$308,000), and 3) expand native sea urchin treatment of invasive algae in Kāne'ohe Bay (\$782,413).
- Congressional allocation via NOAA Pacific Islands Regional Office non-competitive award – "Promoting recovery of insular false killer whales, hawksbill and green sea turtles, and Hawaiian monk seals in the state of Hawai'i" – \$375,000.
- U.S. Fish and Wildlife Service Competitive State Wildlife Grant awarded for "Modernizing the -U.S. Fish and Wildlife Service Hawai'i State Wildlife Action Plan with new visualizations and online dashboards" - \$71,866.
- U.S. Fish and Wildlife Service Received a 2023 Alien Nuisance Species (ANS) Award to support the Hawai'i ANS Management Plan (\$96,553).

# DAR Accomplishments Pono Practices

### **Fisheries Management**

#### **Rulemaking Initiatives:**

- Lay net fishing rule amendments approved by Governor; New lay net permit requirement implemented.
- <u>Ocean Stewardship User Fee</u> Rules approved by the Board of Land and Natural Resources (BLNR).
- Molokini MLCD Rule approved by the BLNR.
- Statewide bag and size limits for key herbivorous reef fish approved by the BLNR.
- Comprehensive Licensing Rule Amendments including a <u>Non-Resident</u> <u>Marine Recreational Fishing License</u> – Statewide public hearings held, final BLNR approval scheduled for January 2024.
- Kipahulu CBSFA Rules Statewide public hearings held, final BLNR approval scheduled for January 2024.



#### Wahiawa Public Fishing Area

- Deployed habitat structures in Wahiawa Reservoir to increase habitat, food sources, and provide shelter for gamefish and prey fish populations.
- Worked with fishers to collect invasive clown knife fish for stomach analysis to determine what they are feeding on.

#### Other Actions:

 Implemented a new creel survey design in January 2023 for the Hawai'i Marine Recreational Fishing Survey (HMRFS) Project. Among the changes were replacing paper forms with field tablets and following a more rigid sampling schedule to further minimize sampling bias.

### Enforcement Action

- Brought BLNR enforcement action against the owners of the motor yacht Nakoa grounded near Honolua Bay.
- Brought successful Civil Resource Violations System (CRVS) action against vessel owner who anchored upon coral and live rock at Turtle Canyon, Waikiki.

DAR Accomplishments





### **Education & Outreach**

- Hosted a DAR sharing session on Hawai'i Island for a group of educators and students from the University of Missouri-St. Louis.
- Assisted Hui Ho'oleimaluō with the identification of invasive kanda mullet in Keaukaha, Hilo, and supported the annual Waiuli Ocean Festival.
- Provided classroom and field presentations on aquatic topics.
- Facilitated community action plan meetings to manage local marine resources.
- Participated in <u>Outside Hawai'i</u> series highlighting DAR programs and staff
- Produced and aired a new 30-second television spot <u>"The Reef"</u> encouraging pono practices on reefs.
- Printed and distributed fishing regulations booklets, pono fishing rack cards, posters, and other education and outreach materials.
- Maintained and expanded DAR websites.

- Participated in a three-day "Kilo Kanda" workshop in Hilo, hosted by Kua'āina Ulu 'Auamo. DAR demonstrated estuary cast-net sampling techniques, shared methods on species identification and provided knowledge of kanda lifehistory, behavior and challenges for fisheries management.
- Conducted fisher outreach at fishing tournaments and other public events.
- Hosted the first annual "Ta'ape Throwdown" tournament on Kaua'i.
- Worked with West Maui leaders to provide keiki affected by wildfires with fishing gear and educational supplies.
- Provided environmental court-appointed training to Hawai'i Island fishery violators.
- Participated in Makai Watch training and monitoring.
- Investigated shark bite incidents; added to DAR database and updated shark website.
- Conducted pono fishing and angler education classes and workshops statewide.



# DAR Accomplishments Pono Practices

### **Protected Species**

- Conducted protected species monitoring on O'ahu, Maui, Hawai'i Island, Kaua'i, Moloka'i, and Ni'ihau in coordination with NOAA Fisheries.
- Conducted marine animal (whales, seals, turtles) stranding response operations across the State in cooperation with NOAA Fisheries and other stranding partners, including taking over the UH Hilo stranded turtle response program.
- Started pilot project with nonprofit partners to reduce threats to nesting turtles on Kaua'i.
- Started pilot project to reduce threats to insular false killer whales.
- Supported DOCARE's Makai Watch program, providing protected species training to Makai Watch community groups.
- Expanded the statewide marine debris rapid response net removal program.
- Taught over 1,000 children in 56 classrooms about species, habitat, and threats.

- Grew and continued to lead the statewide Barbless Circle Hook project along with federal partners and attended 18 fishing tournaments.
- Started fishing line collection in Hilo.
- Created new grade-appropriate education materials; new videos, stickers, and blog posts; and materials and Identification guides to encourage citizen science projects and increased reports of strandings.
- Participated in multi-agency Pelagic False Killer Whale Take Reduction Team and Toxoplasmosis and At-Large Cat Technical Working Group.
- Conducted targeted outreach statewide to recreational and commercial fishers about protected species and citizen science via shoreline surveys, "walking the docks," tabling at fishing stores, attending fisher meetings, and direct mailings.
- Conducted protected marine species outreach and education at over 100 public events statewide.

### **DOCARE** Training

- Successful rollout of the CRVS to pilot group of DOCARE officers; participated in training regarding the DAR-related rules.
- Supported DOCARE Academy with an overview of DAR and Aquatic resources regulations.



# DAR Accomplishments Pono Practices

### Permitting and Environmental Review

- Environmental Review program was evaluated and improved with plans to create standardized language references for various laws and best management practices making it easier for staff to complete reviews in a timely manner.
- Provided timely reviews to consultants on impacts to aquatic resources and risk mitigation strategies for numerous projects statewide.
- Provided environmental reviews on Chapter 343 and 195D consultations for a variety of proposed activities statewide.

#### Special Activity Permits

- Provided timely support in issuing Special Activity Permits (SAPs) for research and education needs and marine technical guidance for Film Permit requests, while protecting and stewarding Hawai'i's aquatic resources.
- Provided timely support in providing permit information for UIPA/FOIA requests.
- Evaluated integration of Coral Reef Restoration Framework into ArcGIS Onlinebased permitting portal. The framework will guide permittees to conduct highquality restoration and research with protected coral reef resources.
- Consulted with Division of Forestry and Wildlife (DOFAW) and Hawai'i Coral reef Initiative (HCRI) programmers to begin developing a newer ArcGIS Online-based permitting portal with an anticipated launch in 2024. The new ArcGIS Onlinebased permitting portal will streamline the SAP application and permitting process and provide DAR with real time information about applications/permits which have been submitted/issued, including dashboard type summaries and ArcGIS online maps georeferencing research activities.
- Consulted with Conservation International (CI) to identify bottle-necks, streamline permitting process and start to implement changes to improve efficacy. DAR is currently working with CI to develop a new application / permit template for Special Activity Permits to supplement a new ArcGIS online-based portal, to expedite the permit review and issuance times.







# DAR Accomplishments Place-Based Planning

- Piloted a inclusive and balanced process to select Maui Navigation Team members to develop management actions for Maui nearshore waters as part of the Holomua Initiaitive.
- Conducted Maui Navigation team meetings (2 virtual and one in-person (2-days) to pilot the Holomua place-based planning process for Maui.
- Created an online repository of research, reports, and data for Maui Navigation team members. Developed the Maui Island Profile to compile and share the status of Maui aquatic resources with the Maui Navigation team.
- Facilitated review and compilation of feedback of initial Navigation team management ideas with the Holomua Advisory Network, an interdisciplinary panel of experts.
- Worked with fishers and community members to refine an action plan and associated fisheries regulations for Maunalua Bay, O'ahu.
- Piloted a process for co-developing a management plan for the Pūpūkea Marine Life Conservation District with Malama Pūpūkea Waimea to serve as a template for collaborating with communities to draft management plans for existing marine management areas.

## DAR Accomplishments Place-Based Planning

- Increased social media capacity to improve messaging and communications about the Holomua Marine Initiative.
- Drafted a Lessons Learned document for the Maui Pilot Process, highlighting important successes and areas for future improvement for community engagement processes. Revised and updated the Holomua Roadmap describing the future path of the Holomua Marine Initiative.
- Conducted a report out of Ha'ena Community Based Subsistance Fishing Area (CBSFA) 5-year evaluation with Ha'ena community members, Hawaii Institute of Marine Biology, Division of Conservation and Resources Enforcement, The State Makai Watch program, and the Division of Aquatic Resources.
- Conducted a public hearing for the proposed Kīpahulu Community-Based Subsistence Fishing Area on Maui.
- The Kōkua Community Based Monitoring Program along with the Aquatic Invasive Species Program and the Coastal Zone Management Program added a new pilot site for community-based monitoring in Ko Olina with the community group Ka'uikiokapō.



# DAR Accomplishments Place-Based Planning

#### Papahānaumokuākea Marine National Monument

Continued to participate as a co-manager for PMNM

- Participation in various working groups with other co-managers and partners covering topics such as resource protection, permitting, communications, and Native Hawaiian culture.
- Participated on a research cruise into PMNM to study a nuisance alga, Chondria tumulosa. DAR continues to study this alga and its potential threat to the Main Hawaiian Islands (MHI) and PMNM in partnership with PMNM comanagers and other researchers.
- Led biosecurity experiments and participated in surveys of nuisance alga Chondria tumulosa conducted in Papahānaumokuākea Marine National Monument.
- Assessed biosecurity related to Chondria tumulosa at the Papahānaumokuākea Marine Debris Project (PMDP) ship and marine debris offload after returning from the Northwestern Hawaiian Islands (NWHI).
- The DAR Aquatic Invasive Species Team continues to support hull surveys of vessels departing for PMNM and other local invasive species prevention projects to support the continued protection of the whole archipelago from the threat of invasive species.

DAR and the National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) continued their coordinated efforts in the National Marine Sanctuary designation process for Papahānaumokuākea.

- Participated in meetings, outreach at local events, produced educational materials, and conducted outreach to schools and DAR partners.
- Participated in the drafting of sanctuary designation documents to be published in 2024.
- Ensured State requirements were met such as drafting Cultural Impact Assessments and collaboration with the State Historic Preservation Division among others.
- Provided overall planning and preparation support for publication of draft documents, and public meetings, scheduled for 2024.

# DAR Accomplishments Place-Based Planning

#### Hawaiian Islands Humpback Whale National Marine Sanctuary

- Continued to co-manage HIHWNMS, including managing the Sanctuary Advisory Council, strategic planning, cooperative financial support, sharing staff for special projects, sharing vessel time, and liaising with other state or federal agencies.
- Designed a cooperative research project on the ecological relationship between humpback whales in Hawai'i and small pelagic fishes (e.g., 'opelu) with HIHWNMS and university partners.
- Designed cooperative research projects on humpback whale feeding and zoonotic disease prevalence with HIHWNMS and university partners.
- With HIHWNMS, assisted University of Hawai'i install ocean chemistry buoy for climate change monitoring at Olowalu, Maui as part of cooperative project that also includes NOAA Fisheries and PACIOOS.
- Continued to participate in national climate adaptation working group and work with HIHWNMS staff on upcoming climate vulnerability assessment.
- Continued cooperative outreach and education push on best boating practices during whale season, with HIHWNMS, DOBOR, DOCARE, NOAA Fisheries and PWF.
- Conducted cooperative outreach and education on marine species and ecosystems at community events with HIHWNMS.
- Expanded citizen science "ocean count" (whale count) to Molokai; continued citizen science coral monitoring project on Molokai.
- Mentored graduate students working with HIHWNMS and DAR.
- Trained and participate as HIHWNMS' large whale entanglement team responders.
- Assisted with HIHWNMS field research.
- Coordinated permits and regulations.
- Managed DAR's stranded whale response, including providing significant assistance for large, deceased whales.

### **Sea Urchin Hatchery**





Image:. Team celebrates release of the one millionth native sea urchin into Kāne'ohe Bay, named "Vince" in honor of long-time DLNR staff Vincent Goo; native Hawaiian collector urchins *Tripneustes gratilla* graze on invasive alien seaweeds. Credit DLNR

- Outplanted over 160,000 hatchery raised juvenile sea urchins to reefs in Kāne`ohe Bay, totaling over 1.1 million urchins outplanted since 2011.
- Co-authored a peer-reviewed journal article on the benefits of sea urchin biocontrol on coral recruitment, and sea urchin / coral co-culture.
- Supplied juvenile urchins, limu, and benthic bioflims to partner projects at the Waimanalo Limu Hui, the Waikīkī Aquarium, the Hawai'i Institute of Marine Biology, University of Hawai'i, Chaminade University, and the Maui Ocean Center Marine Institute.
- Hosted researcher from University of Maine, Center for Cooperative Aquaculture Research in support of their sea urchin hatchery and commercialization plans for the State of Maine.
- Continued collaboration with the Department of Marine Sciences, University of Puerto Rico, Mayaguez, supporting hatchery and sea urchin biocontrol research.

### Limu Restoration

 We continue to provide tank space, water, and air for volunteers to cultivate limu for limu restoration. This year Grateloupia phuquocensis was identified as alga that can be cultured at AFRC.



Image:. Native vegetation restoration underway at He'eia with partner Kāko'o 'Ōiwi. Credit DLNR

### **Estuarine Restoration**

- Developed Protection and Restoration Strategies for Marshes and Anchialine Pools through and EPA Grant, which will be completed in early 2024.
- Restored 15 acres of wetlands in He'eia, O'ahu with Kāko'o 'Ōiwi, including outplanting eleven native and culturally important plants, establishing floating island habitats, and removing invasive predators.
- Cleared three acres of invasive mangrove from Honouliuli stream on O'ahu and outplanted over 380 native plants along the stream.
- Partnered with community members and DLNR Engineering to restore ground water flows at Kalauha'iha'i fishpond to allow freshwater to again flow through its stone 'auwai into Maunalua Bay to reestablish juvenile fish habitat. Anticipating this, the DAR Estuary Team, in collaboration with Maunalua Fishpond Heritage Center, monitored beforerestoration conditions in the estuary, using cast nets and eDNA sampling methods, to document changes.

### Aquatic Invasive Species & Environmental Response

- Responded to a report of a non-native aquatic plant, manatee mudflower (*Micranthemum glomeratum*) found in Nu'uanu stream by Ginger Pond.
- Implemented a risk screening tool to assess six species that were newly introduced to Hawai'i.
- Collaborated with the Coordinating group on Alien Pest Species (CGAPS), Department of Defense, Bishop Museum, USFWS, NOAA, UH, and colleagues from DAR on the non-native species responses within Pearl Harbor.
- Conducted annual surveys to monitor invasive algae in Kāne'ohe Bay and the Waikīkī MLCD.
- Completed monitoring operations at two sites offshore of Sand Island for *Avrainvillea erecta*.
- Removed seven invasive Montipora foliosa colonies found during nonnative coral removal follow-up surveys in Kāne'ohe Bay.
- Prepared Super Sucker system to re-launch manual invasive algae removal in Kāne'ohe Bay.
- Performed hull inspections on three vessels as part of permit applications for entry to the Papahānaumokuākea Marine National Monument.
- Continued biocontrol management of invasive algae by outplanting hatchery-raised juvenile sea urchins in 235 acres of Kāne'ohe Bay.
- Collected and processed ballast water reporting forms from 946 vessel arrivals in 2023.
- Participated in outplanting coral modules from the Hawai'i Coral Restoration Nursery and continued monitoring 132 outplanted modules.
- Collected and analyzed ballast water data from 961 vessel arrivals in 2022 and presented at the 2023 Pacific Ballast Water Group Meeting.



#### AIS & Env. Response continued

- Developed new outreach materials including pamphlets, stickers, displays, and a plan for implementing new outreach at recreational harbors.
- Performed a practical demonstration at a Glofouling workshop and consulted for the International Maritime Organization (IMO) publication on Biofouling Management in MPAs and PSSAs.
- Continued to collaborate with the US Coral Reef Task Force on Stony Coral Tissue Loss Disease prevention in the Pacific and transmission research priorities including a panel presentation at the 47th USCRTF Meeting.
- Collaborated with California, Oregon, and Washington on the implementation of a new ballast water data-sharing system (PAC-Dash) with quarterly updates.
- Drafted four collaborative multi-state letters related to the Vessel Incidental Discharge Act submitted to the EPA and USCG.
- Published a peer reviewed study titled "<u>Complex</u> <u>drivers of invasive macroalgae boom and bust in</u> <u>Kāne'ohe Bay, Hawai'i</u>" evaluating the potential drivers of the rapid decline of invasive algae in Kāne'ohe Bay. The study showed a significant link between the decline in invasive algae and an increase in herbivorous reef fish biomass.
- Responded and assessed coral and live rock damage of a P-8A Poseidon Navy Airplane that overran the Marine Corp Base Hickam runway into the adjacent coral reef.
- Conducted recreational vessel hull fouling surveys at six small vessel harbors on Oahu to gather information about hull husbandry practices, voyage history, and general knowledge of biofouling and aquatic invasive species; surveyed a total of 385 vessels and 12 harbor users.

### Sport Fish Restoration

- Performed 18 artificial reef surveys at Keawakapu (11), Maunalua Bay (2), Waianae (2), and Kualoa (3). This data will provide information on fish biomass, density, and diversity on existing artificial reefs.
- Began the permitting process to expand the artificial reefs in Waianae and Maunalua Bay.
- Performed pilot 'structure from motion' orthoimagery surveys on Waianae and Manunalua Bay artificial reefs and created Digital Elevation Models.
- Stocked 25,800 rainbow trout for the Kōke'e Public Fishing Area (PFA), Kaua'i.
- 2,808 angler visits to the 2023 Kaua'i Trout Fishing Open caught 16,871 rainbow trout.
- Continued to support public fishing at Wahiawā PFA, Oʻahu and Waiākea PFA, Hawaiʻi island.
- Deployed 32 Fish Aggregation Devises (FAD)s to bring the fad array back to full capacity with support from the State Legislature and increased federal funds.







Images: Fish Aggregation Device (FAD) in nearshore waters; stocking trout at Pu'u Lu'a reservoir, Kōke'e; Largemouth bass *Micropterus salmoides* from the Wahiawā Public Fishing Area. Credit DLNR

### **Coral Restoration**

- Expanded coral restoration efforts to include a total of seven sites on O'ahu, including a coral restoration project in Hanauma Bay Marine Life Conservation District.
- Outplanted 55 nursery grown coral modules, including 1-meter diameter corals and the first outplants of the rare corals *Porites lichen* and *Porites rus*.
- Engaged in new and continued collaborations with researchers at University of Hawai'i (UH), Hawai'i Institute of Marine Biology (HIMB), and other research institutions.
- Continued to develop and test new coral reef restoration techniques, including testing biotic and abiotic coral larvae settlement cues, polyp bailout techniques, crustose coralline algae fastgrowth and "paint," asexual planula reaggregation and production.
- Continued to develop expansion plans for the Rare Hawaiian Coral Ark, which maintains over 50 species of corals.

- Co-hosted the 2023 Hawai'i Coral Restoration Symposium which gathered 100 coral restoration practitioners and researchers statewide to share their work and advancements in the field.
- Launched a West Hawai'i coral restoration program through the federally funded Resilient Reefs Initiative focused on stabilization of damaged coral heads and the development of a new land-based nursery in West Hawai'i.
- Published the <u>Makai Restoration</u> <u>Action Plan for Goal 1: Bleaching</u> outlining statewide multi-partner geographic focus areas and interventions for reef restoration through 2030.
- Finalized the DAR Special Activity Permit (SAP) Coral Reef Restoration Framework, which will guide permittees to conduct high-quality restoration and research with protected coral reef resources.



- Completed coral reef surveys in West Hawai'i as part of the West Hawai'i Aquarium Project (WHAP), Coral Settlement Monitoring, and Fish and Habitat Utilization Project (FAHU).
- Established new FAHU monitoring sites in East Hawai'i: Pepe'ekeo, Pauka'a, Blonde Reef, Puhi Bay, Lālākea, and Waiuli. Over 70 surveys have been conducted across these sites.
- Surveyed five miles of new coastline from the 2018 lower Puna eruption for naturally forming anchialine habitats. To date, approximately 70 new and pristine pools with endemic species have been recorded in the area.
- Continued to survey fish and habitat at established monitoring sites throughout Hawai'i.
- Continued to survey all Coral Reef Monitoring sites throughout the state.
- Collaborated with federal agencies and the state Department of Health to monitor coastal water quality and sediments offshore of Lahaina following the devastating Lahaina wildfire.
- Established regular fish monitoring sites on the southern side of Molokai
- Produced instructional videos for staff to improve how they navigate and interact with data dashboards designed for streams, estuaries, and coral reefs.
- Expanded cast net and eDNA monitoring to include Waimea River Estuary on Kaua'i. Invited community leaders to experience field work with DAR staff.



- Piloted a novel environmental DNA (eDNA) methodology for use in estuaries and streams to improve the sampling design.
- Sampled Kihei lagoonal estuaries and wetlands using environmental DNA (eDNA) to document fish diversity in collaboration with the South Maui Save the Wetlands Hui.
- Completed the fifth year of Baited Remote Underwater Video (BRUV) monthly monitoring in Wailoa River estuary. By using a remote underwater camera, large predators as well as fish behavior are documented in deep sections of estuaries.
- Completed an eDNA baseline aquatic biodiversity study in six West Maui streams and estuaries selected for management action by CWRM.

- Completed the eighth year of quarterly cast net monitoring for juvenile fishes' use of estuaries on four islands.
- Presented on environmental DNA as a metric to evaluate fish response in estuaries and streams to the temporary return to 100% baseflow conditions in selected East Maui streams at the international Coasts and Estuaries Research Federation conference.
- Expanded estuary quarterly monitoring to include environmental DNA (eDNA) together with cast net sampling. By integrating biodiversity data an additional metric is being used to track conditions in this critical aquatic ecosystem.
- In collaboration with the University of New Hampshire, added 96 aquatic species from Hawai'i to the worldwide DNA library database.

- Facilitated restoration of ground water flows at Kalauha'iha'i fishpond allowing freshwater to again flow through its stone 'auwai into Maunalua Bay, reestablishing a productive juvenile fish habitat. Anticipating this, the DAR Estuary Team, in collaboration with Maunalua Bay Fishpond Heritage Center, monitored before-restoration conditions in the estuary, using cast nets and eDNA sampling methods, to document changes.
- Continued upgrading the DAR monitoring database, which secures ecosystem survey data gathered in streams, estuaries, coral reefs, and from creel surveys.
- To improve the data entry experience and reduce costs long-term, a new Marine Monitoring data entry application was developed, custom-coded, and launched.
- Continued to monitor the possible aquarium release and spread of Caulerpa parvifolia algae in Kalapaki Bay, Kaua'i.
- Collaborated with NOAA to perform fish and habitat dive surveys in Papahānaumokuākea to monitor the effect of the presence and spread of Chondria tumulosa.
- Worked with Virginia Institute of Marine Science and the National Park Service to design and carry out lobster surveys in Kalaupapa National Park, Moloka'i.
- Supported community limu monitoring efforts at Moomomi and Kipahulu.
- Continued to monitor and record rates of black band disease found in coral around Kaua'i.
- Responded to reports of, and removed, nonnative coral in 'Anini, Kaua'i.







- Participated in the "Kilo Kanda" workshop in Hilo, November 19-21, hosted by Hui Mālama Loko I'a (Kua'āina Ulu Auamo), Kamehameha Schools Kumuola Marine Science Education Center and Hui Ho'oleimaluō. The purpose of the workshop was to share and learn about invasive kanda in loko i'a and Hawaiian estuaries. Participants included kia'i loko (fishpond caretakers), students, community group leaders, educators and managers. The DAR Estuary Team demonstrated estuary cast-net sampling techniques, shared methods on species identification and provided their experiences and knowledge of kanda life-history, behavior, and challenges for fisheries management.
- Continued collaboration with NOAA, UH Hilo, and ASU on combined eDNA, visual, and photogrammetry surveys in West Hawai'i.
- Piloted eDNA field sampling methods in remote anchialine pools on Hawai'i Island.
- Created a project to build a customized data entry application and database tables for environmental DNA metadata collected in steams and estuaries statewide.





### Pono Practices

- Adopt and implement a non-resident marine recreational fishing license, commercial marine vessel license, and commercial marine dealer license.
- Administer new Ocean Stewardship User Fee program.
- Collaborate with federal partners to develop internal capacity to conduct stock assessments for priority nearshore species.
- Develop fishery management frameworks for priority fisheries.

### Place-Based Planning & Fisheries Co-Management

- Finalize the Kipahulu Community based Subsistence Fisheries Area rules.
- Conduct rulemaking to establish the Maunalua Bay Fisheries Management Area.
- Continue to support communities interested in community-based fisheries co-management efforts, such as Ka'upulehu, Kiholo, Ho'okena and Ko'olina.
- Complete Maui Pilot process for the Holomua Marine initiative and prepare for scoping of the Maui Navigation team proposal.



### **Ecosystem Monitoring**

- Apply Innovative fish aging methodology to the Uouoa life history study, a mullet species that uses estuaries as juveniles.
- Collaborate with Coastal Zone Management to complete an inventory of estuaries on Hawai'i Island, create statewide GIS layers for estuaries, standardize terminology for the inventory, and coordinate with other projects focused on developing new GIS layers, such as beach locations.
- Expand environmental DNA (eDNA) monitoring to understudied estuaries on Moloka'i and Lāna'i, and work with community members to include places of significance.
- Continue estuary work in collaboration with Maunalua Bay Fishpond Heritage Center, CWRM, Engineering Division, and others to reestablish ground water flow to Kalauha'iha'i fishpond and freshwater inflow to Maunalua Bay.
- Develop an estuary habitat restoration monitoring program in Waiakea Pond and Wailoa River to measure the effects of invasive grass removal and re-establishment of native sedges to improve estuarine sport fish habitat.
- Migrate fish tagging data from an obsolete database to the DAR monitoring database. Next build a customized data entry application as well as data dashboards for fish tagging data.

- Complete the project for a customized data entry application and database tables to house environmental DNA metadata.
- Update customized data entry application for creel surveys to capture recent data collected using innovative electronic devices.
- Conduct Structure-from-Motion surveys in areas with coral disease and permanent CRAMP sites.
- Continue Fish and Habitat Utilization Surveys (FAHU) across the Main Hawaiian Islands to provide spatial and temporal data to inform management decisions.
- Finalize protocols for West Hawai'i FAHU surveys to maximize survey efficiency and increase replication
- Streamline data processing for West Hawai'i FAHU fish and benthic data including postcollection protocols for Structure-from-Motion Photogrammetry data.
- Explore methods for high-resolution photogrammetry to track coral growth and cover metrics at fine scales.
- Begin development of monitoring plans for current and past monitoring projects in West Hawai'i to clearly define project scope, goals, methodology, and planned analyses.

#### Ecosystem Monitoring cont.

- Develop drone coastal surveys and mapping efforts around Maui, Molokai and Lanai, to better map out nearshore habitats and prioritize future management and monitoring efforts.
- Increase the number of nearshore FAHU surveys along the leeward coastline of Molokai, and involve community groups to develop collaborative monitoring with the local community.
- Increase fishing effort and interview surveys, and develop specific targeted surveys of spear fishers in-order to better measure non-commercial take of key Herbivorous fish species.
- Collaborate with other agencies and researchers to better monitor water quality offshore of the Lahaina Fire burn area, and work to integrate monitoring data into efforts to prioritize runoff mitigation efforts.
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### Restoration

- Finalize coral reef restoration plan for shoreline protection.
- Initiate coral reef restoration plan for fisheries habitat.
- Initiate a process to identify water quality issues and needs regarding aquatic resources that DAR has jurisdiction over.
- Plan the development of the Anuenue Fisheries Research Center Annex (Sand Island) to accommodate restorative aquaculture efforts.
- Begin in-water coral stabilization work at two West Hawai'i focal sites: Kealakekua Bay Marine Life Conservation District and Kahalu'u Bay in active collaboration with community cultural practitioners and stewards.
- Plan the refurbishment of the Wailoa Fisheries Station (Hilo) to accommodate restorative aquaculture efforts.

• Conduct initial tests of the West Hawai'i coral restoration nursery life support system in partnership with Arizona State University.





### Administrative

- Develop Annual District Reports including metrics for tracking aquatic resource status over time in response to environmental change, use, and management activities.
- Complete the 2025–2030 DAR Strategic Plan.
- Complete the re-organization to place newly established positions.
- Fill vacant positions.