

# HAWAI'I

## CORAL REEF STRATEGY 2030

---

ECOSYSTEM PLANNING PRIORITIES IN  
THE MAIN HAWAIIAN ISLANDS



STATE OF HAWAI'I  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF AQUATIC RESOURCES

This strategy was made possible with support from the National Oceanic and Atmospheric Administration's Coral Reef Conservation Program



## DIVISION OF AQUATIC RESOURCES

### *ADMINISTRATOR'S NOTE*

The mission of the State of Hawai'i Department of Land and Natural Resources Division of Aquatic Resources is *to work with the people of Hawai'i to manage, conserve and restore the state's unique aquatic resources and ecosystems for present and future generations*. As the primary agency responsible for Hawai'i's coral reef management, the division steers the collective passion and dedication in the main Hawaiian Islands towards a resilient and sustainable future for coral reefs.

Our staff is working alongside partners to monitor water quality of our nearshore environments, develop management plans for diverse aquatic resources, and research and restore the functions of our coral reef ecosystems. In addition, we have standalone

programs dedicated to the removal and prevention of aquatic invasive species, coral restoration, and reef fisheries management. These initiatives have come to represent a comprehensive approach, engaging communities and decision-makers at all stages of management.

The greatest hope for preserving and sustaining these marine resources lies in a collective stewardship by its many users and beneficiaries. This strategy details our commitment to co-management, partnerships, and community engagement as the best course forward. With the combined efforts of all resource users, mauka to makai, the future of Hawai'i's coral reefs is bright and clear.

– Brian Neilson, Administrator

# TABLE OF CONTENTS

Administrator's Note.....	i
About the Strategy.....	1
Partnership.....	3
Sustainable Use.....	5
Pollution Reduction.....	7
Makai Restoration.....	9

## ABOUT THE STRATEGY

*The Hawai'i Coral Reef Strategy 2030: Ecosystem Planning Priorities in the Main Hawaiian Islands* represents the programmatic focus of coral reef ecosystem planning within the Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR). This *HCRS 2030* applies research and evaluations, technology, funding, and knowledge sharing that is collaborative and beneficial for all.

*Vision of the HCRS 2030:*

*To ensure thriving, diverse, resilient coral reefs that sustain valuable ecosystem services for present and future generations.*

Throughout the framework of coral reef conservation and management is *resiliency*: the capacity to recover from a disturbance and maintain or re-establish a diverse and rich reef ecosystem. Resiliency is the essential target for an enduring coral reef environment and is an integral part of each of the four pillars in this strategy: Partnership, Sustainable Use, Mauka Intervention, and Makai Restoration.

All across the state, partners are building on the successes of the previous Hawai'i Coral Reef Strategy (HCRS 2020) and the enduring legacy of conservation present in generations of island stewards. These efforts have established a solid foundation for reef resiliency.

In 2016, the goals of the HCRS were further prioritized in the Marine 30x30 Initiative, which aims to *“Effectively manage Hawai'i's nearshore waters with 30% designated as a marine management area by 2030.”*

Within this statewide initiative, the HCRS plays a critical role in not only demonstrating the enormous conservation capacity of place-based management, but also to continue expanding effective management of coral reefs throughout the Main Hawaiian Islands.

## HCRS 2020 HIGHLIGHTS

The first HCRS 2020 guided coral reef management over the course of a decade. In total, 25 projects were conducted with funding support from the National Oceanic and Atmospheric Administration. These largely addressed the priority areas of West Maui and South Kohala, but also set into motion essential processes to bring effective management to Hawai'i's nearshore reefs. A summary of these accomplishments was published in the HCRS 2020 Retrospective.

Community-based fishery areas civil service position further establishes DAR program **2019**

**2018** Roadmap to 30x30 is drafted to guide DAR's implementation of the Marine 30x30 Initiative

Corals of opportunity program focuses on broken fragments to seed restoration activities **2017**

**2016** Coral Bleaching Recovery Plan identifies spatial herbivore management as a top priority

Hawai'i Environmental Court focuses exclusively on environmental cases **2015**

**2014** Moon calendars created to aid sustainable fishing practices through local knowledge

Statewide day-use mooring buoy program is developed to reduce anchor damage to reefs **2013**

**2012** Makai Watch Strategy Workshop standardizes community-level stewardship program

West Maui and South Kohala designated as priority ridge-to-reef management areas **2011**

**2010** South Kohala Conservation Action Plan – Phase I & II begin for Kawaihae-Puako

## HCRS 2030

The DAR Ecosystem Planning Section is coordinating with DAR's other programs like the Marine 30x30 and Community-Based Fishing Areas to develop projects in support of the goals, objectives, and actions described in this strategy. Planning and implementing these activities will furthermore involve partnering with communities. The HCRS 2030 honors and respects local initiatives by building capacity and uplifting community leadership in coral reef conservation, management, and restoration. This approach leverages the collective strength of many to achieve the greatest outcomes and benefits for Hawai'i.

### CONTENTS

PILLARS	GOALS	OBJECTIVES
PARTNERSHIP	Support natural resource regulations and planning processes that are effective both environmentally and socially.	<ol style="list-style-type: none"><li>1. Address gaps and strengthen compliance with the existing natural resource laws and policies.</li><li>2. Develop transparent and adaptive management partnerships that reflect the dynamic nature of coral reef ecosystems.</li></ol>
SUSTAINABLE USE	Enable participation in, and enjoyment of, sustainable nearshore activities.	<ol style="list-style-type: none"><li>1. Support pono practices within an enduring fishing culture that benefits protected resources recovery and conservation.</li><li>2. Encourage sustainable use of coral reef ecosystems.</li></ol>
MAUKA INTERVENTION	Develop statewide capacity for sustainable mauka restoration and management.	<ol style="list-style-type: none"><li>1. Develop the foundations of a Watershed Restoration Program within DAR to support water quality management from ridge to reef.</li><li>2. Strengthen and expand existing water quality restoration in West Maui and South Kohala.</li></ol>
MAKAI RESTORATION	Increase the ecological function and integrity of coral reefs.	<ol style="list-style-type: none"><li>1. Develop DAR's role in coral reef ecosystem management for restoration projects statewide.</li><li>2. Support effective restoration projects, especially those that are led by public and private partners.</li></ol>

# PARTNERSHIP

**Goal:** Support natural resource regulations and planning processes that are effective both environmentally and socially.

Managing, conserving, and restoring the state's unique aquatic resources and ecosystems is the shared mission of DAR and the people of Hawai'i. It is the division's responsibility to cultivate partnerships for effective management. This involves comprehensive monitoring and research, community-level planning, and management interventions that engage the diverse capabilities and knowledge throughout the state.

It is important to establish regulations based on community knowledge. Bottom-up approaches to management have proven applications both in Hawai'i and worldwide, strengthening local ownership of natural resources and improving the appropriateness and benefits of regulations. The state's approach to coral reef ecosystem co-management connects the needs of the people with the needs of the resources.



## OBJECTIVES & ACTIONS

*Objective 1: Address gaps and strengthen compliance with the existing natural resource laws and policies.*

- 1.1. Dedicate a staff position to analyze and evaluate enforcement of coral reef laws and policies, and recommend strategies and administrative rules for improvement.
- 1.2. Invest in current and emerging technology to meaningfully engage communities in understanding, improving, and complying with rules and regulations relating to coral reef management.
- 1.3. Incorporate community knowledge and input into ecological, socioeconomic, and cultural considerations for coral reef rules and policies.
- 1.4. Implement education and outreach that engages DAR staff, DOCARE officers, and the public.

*Objective 2: Develop transparent and adaptive management partnerships that reflect the dynamic nature of coral reef ecosystems.*

- 1.5. Prioritize community-based planning and co-produce solutions.
- 1.6. Identify and coordinate opportunities for adaptive management throughout DAR's coral program with an emphasis on routine monitoring and evaluation.
- 1.7. Engage with agencies, organizations, and communities on resiliency-oriented co-management.
- 1.8. Support collaborative data collection that increase transparency by publicly celebrating successes, tracking progress, and openly discussing challenges.
- 1.9. Include a diversity of monitoring and modeling data so that adaptive management can respond promptly to shifting environmental and social conditions.

### Outcomes:

- Improved regulations pertaining to coral reefs
- Increased awareness, understanding, and compliance with Hawai'i's laws and policies
- Implementation of widespread community-based approach to coral reef management
- Long-term partnerships that produce evaluative data to continually adapt and improve management

### Additional Resources

[Department of Land and Natural Resources – Coral Reefs Regulations](#)

[Holomua: Marine 30x30 Initiative](#)



# SUSTAINABLE USE

**Goal:** Enable participation in, and enjoyment of, sustainable nearshore activities.

Since the earliest days of settlement, coral reef ecosystems have provided invaluable services and uses to the islands' residents and visitors alike. Fisheries provide 7 million meals annually and are valued at \$10.3 - \$16.4 million USD. The state's largest economic sector, tourism, generates close to \$17 billion USD annually and exceeded a record-setting 10 million visitors in 2019. Many of these visitors will directly and indirectly enjoy the benefits of a vibrant reef ecosystem. Moreover, coral reefs provide opportunity for advancement in biological and ecological sciences, medicinal research, career development, and education. For these reasons, ensuring the long-term sustainability of Hawai'i's coral reefs is of the utmost importance.



## OBJECTIVES & ACTIONS

*Objective 1. Support pono practices within an enduring fishing culture that benefits protected resources recovery and conservation.*

- 2.1. Improve species-specific or gear-specific fishery rules through monitoring & evaluation of how such rules can achieve social and economic goals while minimizing the risks and costs to ecosystem services.
- 2.2. Co-produce and share fisheries best practices with fishery managers and the fishing communities.
- 2.3. Bolster understanding of the social and economic importance of fisheries activities and increase sharing of fisheries and coral reef status trends.
- 2.4. Engage fishers in data collection and fact-finding to co-produce effective and adaptive management strategies.
- 2.5. Collect non-commercial fishery-dependent data to support effective management.

*Objective 2. Encourage sustainable use of coral reef ecosystems.*

- 2.6. Implement education and outreach that services both residents and visitors.
- 2.7. Provide marine resource expertise to DLNR divisions involved with ocean recreation.
- 2.8. Increase monitoring and research of ocean recreation's impacts on Hawai'i's marine environments and wildlife, particularly SCUBA and snorkeling activities on coral reefs.
- 2.9. Develop best practices and guidance for the tourism industry and other uses of coral reef ecosystems.

### Outcomes

- Productive and sustainable coral reef fisheries and ecosystems
- Pono fishing practices
- Co-produced best practices that guide sustainable coral reef ecosystem uses
- Sustainable tourism integrated as a component of DAR's mission

### Additional Resources

[Department of Land and Natural Resources – DAR Fishing Frequently Asked Questions](#)

An aerial photograph of a mountain range, likely in Hawaii, showing a valley with a river and a coastline in the distance. The sky is blue with some clouds.

# MAUKA INTERVENTION

**Goal:** Develop statewide capacity for sustainable mauka restoration and management.

In Hawai'i, watershed management includes a diversity of communities *mauka to makai*, from ridge to reef. In the absence of effective watershed management, coral reefs can be negatively impacted by impaired water quality due to land-based sources of pollution (**LBSP**). These include sediment, sewage, nutrients, contaminants like microplastics, and other pollutants transported in surface water runoff and by groundwater seepage. Preventing and mitigating LBSP is essential to sustaining and restoring Hawai'i's coastal ecosystems.

With the help of state agencies and organizations, communities are working to reduce the threats of LBSP and restore nearshore water quality. Priority area partnerships in West Maui and South Kohala on Hawai'i Island have effective and adaptive management strategies for their watersheds, which are important sites for developing scalable improvements in water quality. In these focus areas, managers have worked through a framework of understanding coastal water quality issues, identifying sources of LBSP, and supporting targeted mitigation to reduce or eliminate threats. By learning from and scaling up this approach, DAR intends to build upon the success achieved in West Maui and South Kohala while expanding statewide. Collaboration, coordination, and partnerships have been key, and this strategy will leverage those important partnerships to amplify results.

## OBJECTIVES & ACTIONS

*Objective 1: Develop the foundations of a Watershed Restoration Program within DAR to support water quality management from ridge to reef.*

- 3.1. Institutionalize statewide and island coordinator positions to lead and facilitate collaborations within DLNR and with other partners and community members.
- 3.2. Identify areas for targeted LBSP reduction with particular focus on the protection of priority coral reef ecosystems statewide. Use rapid assessments in new areas where appropriate.
- 3.3. Create a Watershed Restoration strategic plan to support adaptive management and partnerships.
- 3.4. Incorporate wetlands, estuaries, and mauka aquatic resource management into coral reef ecosystem planning.
- 3.5. Expand community-based water quality monitoring and centralized data management to identify and track water quality impairments statewide.
- 3.6. Develop partnerships, trainings, public resources, and best practices.
- 3.7. Plan for and implement rapid and long-term best management practices in response to extreme events impacting coral reefs, such as sedimentation and debris runoff.

*Objective 2: Strengthen and expand existing water quality restoration in West Maui and South Kohala.*

- 3.8. Develop and implement locally-established management plans to suit specific needs for managed watersheds.
- 3.9. Support water quality research and LBSP mitigation projects within established management areas that directly benefit coral reef ecosystems.
- 3.10. Use monitoring & evaluation frameworks from management plans and the Watershed Restoration strategic plan to assess progress and adapt actions.
- 3.11. Apply frameworks for success to the adjacent regions on Hawai'i Island and Maui where partnerships can be established and supported.

## Outcomes

- Established Watershed Restoration Program to address water quality and ecosystem health for aquatic resources
- Expansion of the Watershed Restoration Program to include areas on Kauai and Oahu
- A strategic plan to assess progress of watershed management, water quality, LBSP priorities, and the vulnerability and resilience of nearshore ecosystems
- Success of South Kohala and West Maui focus areas is expanded to include other regions of Hawai'i Island and Maui
- Strengthened partnerships and collaboration to manage water quality and LBSP statewide

## Additional Resources

[South Kohala Coastal Action Plan 2030](#) & [West Maui Ridge 2 Reef Initiative](#)



# MAKAI RESTORATION

**Goal:** Increase the ecological function and integrity of coral reefs.

Nearshore coral reef restoration in Hawai'i is dedicated to the wellbeing of coral reef ecosystem features, processes, and functions. Recent widespread impacts and coral bleaching events have created an urgent need for restoration projects, an increasing number of which are coordinated by private groups and an emerging industry. These projects build upon *makai* (seaward) state efforts to increase live coral cover, protect marine biodiversity, replenish herbivores, and improve habitat. As these community partners expand their roles in restoration activities, DAR will provide essential regulatory oversight to best support and improve statewide projects.

While *restoration* calls to mind a complete reversal of impacts, recent science has demonstrated the value of resilient species and the importance of understanding natural phase shifts in an ecosystem. Restoration therefore does not necessarily entail returning a system to an exact previous state, but rather prioritizes the coral reef ecosystem's services, integrity, and function. Part of DAR's role will be establishing those targets for restoration and evaluating projects in their effectiveness. The state anticipates an increase in coral restoration activities and will develop its capacity to facilitate this process.

## OBJECTIVES & ACTIONS

*Objective 1: Develop DAR's role in coral reef ecosystem management for restoration projects statewide.*

- 4.1. Establish decision-making permit framework for private and public restoration projects.
- 4.2. Simplify public access to resources that clarify regulatory obligations for permit applicants.
- 4.3. Increase the capacity of both DAR and DOCARE staff to identify unpermitted restoration activities and assist projects to come into compliance with regulations and best practices.
- 4.4. Monitor the ecology and population statuses of reef invertebrates, fishes, and their habitats to identify their roles in reef resiliency and restoration, and the effectiveness of management.
- 4.5. Use spatial mapping tools to track permitted restoration activities, impacted reefs, and resilient coral assemblages.

*Objective 2. Support effective restoration projects, especially those that are led by public and private partners.*

- 4.6. Provide opportunities for public participation in restoration activities through outreach and education events, trainings, and workshops.
- 4.7. Expand the state's commitment to herbivore replenishment efforts in support of effective herbivory management.
- 4.8. Develop and improve state coral reef restoration efforts through colony translocation, nursery operations, marine algae removal, and other applied interventions.
- 4.9. Participate in a collaborative research process in which DAR, partners, and the scientific community share and discuss current scientific evidence and theory for the benefit of monitoring and restoration projects in the state.
- 4.10. Plan for and implement rapid and long term coordinated emergency response and recovery efforts in response to natural disasters, industrial and mechanical incidents (including vessel groundings, hazardous spills, and coastal construction accidents), and new or ongoing outbreaks of disease, invasive or nuisance species, and bleaching.

## Outcomes

- Framework for permitting restoration activities
- Effective monitoring protocols implemented for projects
- Mapping tools to inform management priorities and monitoring efforts
- Coordination among stakeholders in reviewing progress and developing successful interventions
- Increases in the number of compliant restoration projects

## Additional Resources

[DAR Aquatic Invasive Species Strategic Plan 2019 -2024](#) & [DAR Framework for Permitting Coral Restoration Activities 2020](#) & [DAR Coral Reef Restoration Plan](#)

STATE OF HAWAI'I. (2020). HAWAI'I CORAL REEF STRATEGY: ECOSYSTEM PLANNING PRIORITIES IN  
THE MAIN HAWAIIAN ISLANDS 2020.



THIS DOCUMENT WAS PREPARED AND PRINTED WITH SUPPORT FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION CORAL REEF CONSERVATION PROGRAM AND THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY UNDER ASSISTANCE AGREEMENT CD-99T93801-1 TO THE DEPARTMENT OF LAND AND NATURAL RESOURCES, DIVISION OF AQUATIC RESOURCES. THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT THE VIEWS AND POLICIES OF THE ENVIRONMENTAL PROTECTION AGENCY, NOR DOES THE EPA ENDORSE TRADE NAMES OR RECOMMEND THE USE OF COMMERCIAL PRODUCTS MENTIONED IN THIS DOCUMENT.

FRONT COVER PHOTO: ADEMYAN ON GETTY IMAGES PRO  
BACK COVER PHOTO: HAIZHAN ZHENG ON GETTY IMAGES PRO