Improving fisheries sustainability: Performance results and highlights for fiscal years 2021–2026

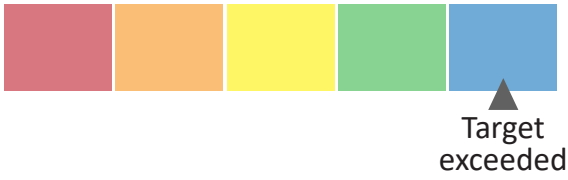
The 2018 Coral Reef Conservation Program strategic plan includes two strategies under the Fisheries Pillar intended to improve fisheries sustainability by working closely with federal, state, and territorial management partners in the seven U.S. coral reef jurisdictions, including the four regional fisheries management councils. These strategies aim to *provide data essential for coral reef fisheries management* and *build capacity for coral reef fisheries management*. This body of work focused on activities to support key coral reef fisheries taxa that play important ecological roles to maintain ecosystem integrity and function. During fiscal years 2021 to 2026, projects aimed to connect managers with tools to support adaptive management and sufficient enforcement of and compliance with fisheries regulations; increase comparability and sharing of data to support decision-making; and foster engagement of fishers, local communities, and key stakeholders.

NOAA's Coral Reef Conservation Program (the Coral Program) invests in supporting capacity, technical assistance, and filling key data gaps for fisheries managers, enabling them to make informed decisions regarding fisheries resources and coral reefs in their jurisdiction. Since 2020, activities and products contributing to the strategies to improve fisheries sustainability have been tracked to document progress toward the strategy's objectives. Information was collected by Coral Program staff members who had direct knowledge of these activities and products. Below, each objective is presented with corresponding performance targets and results, a progress bar, and brief description of progress.

Provide data essential for coral reef fisheries management

Objective 1: By 2022, the Coral Program's fish monitoring data can be statistically compared with data from at least five partners' monitoring programs and shared in a way that managers would use.

Target exceeded; combining fish monitoring datasets from six coral reef jurisdictions (Florida, Hawai'i, U.S. Virgin Islands, Guam, Puerto Rico, and American Samoa) with NOAA's national monitoring program successfully aligned monitoring protocols. Standardizing this data significantly boosts analytical power, directly strengthening stock assessments and regional fisheries management decisions.



Objective 2: By 2024, 75 percent of key Marine Protected Areas (MPAs) have baseline and performance assessments completed.

Target exceeded; by 2024, 86 percent of key MPAs across six jurisdictions (Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawai'i, Puerto Rico, U.S. Virgin Islands) had completed baseline or performance assessments. This informs adaptive management of existing areas and siting of new areas.

Objective 3: By 2026, 75 percent of key coral reef fisheries taxa have completed stock or population assessments that inform current stock or population status and provide quantitative management advice.

Target almost met; eight out of 11 jurisdictions (73%) completed stock assessments for key taxa during the implementation period. To accommodate regions lacking the capacity for traditional assessments, the new National Coral Reef Resilience Strategy expands this goal to include broader, manager-defined ecological and population analyses.

Objective 4: By 2026, 50 percent of Coral Program fisheries research projects include engagement, participation, and cooperation with local stakeholders in development and implementation.

Target met; after initially hitting the 50 percent target for local stakeholder engagement, project participation dropped to between 22 and 38 percent. Integrating community engagement and local and/or traditional knowledge remains a core priority, making these approaches essential for future projects to maximize research impact and utility.

Objective 5: By 2026, 75 percent of key MPAs have various tools and products developed from biological and socioeconomic assessments and disseminated to relevant stakeholders.

Target not met; notably, there were no projects that selected this objective, suggesting that the skillset required for this work is limited with existing Coral Program capacity.

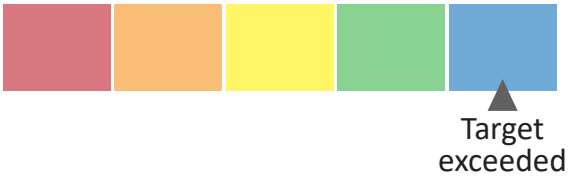
Progress and next steps

Since 2021, the Coral Program has worked closely with jurisdictional partners to compare and integrate monitoring data to be more useful in addressing fisheries management questions. Fiscal years 2021–2026 investments also produced performance assessments for the management of key Marine Protected Areas and provided data to complete stock assessments of key fisheries taxa with four jurisdictional partners and all four fisheries management councils. Our work will continue to support increased data comparability and partners' needs under the National Coral Reef Resilience Strategy's Sustainable Fisheries Focus Area (*Fisheries Sustainability Strategy 2: Provide data essential for coral reef fisheries management*). This includes engaging local fishing communities to incorporate traditional knowledge and sharing learning products to enhance management utility.

Build capacity for coral reef fisheries management

Objective 1: By 2024, 50 percent of jurisdictions and/or foreign management partners are using management capacity-building tools developed cooperatively.

Target exceeded; numerous efforts conducted in both the Atlantic/Caribbean and Pacific basins resulted in 84 percent of our management partners using capacity-building tools, including five U.S. coral reef jurisdictions. Examples include peer-to-peer learning exchanges, small grants programs, legal fellows, sustainable financing plans, and MPA management capacity assessments.



Objective 2: By 2026, 50 percent of domestic and/or foreign partner agencies have adopted or implemented a new or improved approach to strengthen enforcement and compliance.

Target exceeded; by providing tailored training, legal assistance, standard operating procedures, and electronic reporting, the Coral Program supported 23 partner agencies, including six U.S. jurisdictions. Consequently, over 90 percent of partner agencies are now actively implementing improvements to strengthen fisheries enforcement and compliance.

Objective 3: By 2029, Coral Program data and technical assistance have contributed to the body of science informing regulations relevant to key coral reef fisheries taxa in 100 percent of jurisdictions and councils.

Ongoing; So far, we have tracked Coral Program-funded activities in Florida, Guam, and Hawaii that have informed management decision making for those jurisdictions. The South Atlantic and Caribbean fisheries management councils have used data from the National Coral Reef Monitoring Program to adjust minimum size limits for hogfish. This objective remains in the National Coral Reef Resilience Strategy, but it is now more flexible, recognizing there may be significant gaps between management decisions.

Progress and next steps

During the fiscal year 2021–2026 implementation period, the Coral Program successfully connected management partners with numerous tools and strategies to build local capacity and strengthen enforcement and compliance efforts. We exceeded our 2024 and 2026 targets. We also recognize that needs change and new technologies offer novel opportunities to build local capacity for fisheries managers and improve enforcement and compliance of rules and regulations for fisheries management. Future work will be guided by the National Coral Reef Resilience Strategy's Sustainable Fisheries Focus Area (*Fisheries Sustainability Strategy 1: Build capacity for coral reef fisheries management*) to improve fisheries sustainability across U.S. coral reef jurisdictions.

On-the-ground impacts

The following projects highlight how scientists and managers are addressing priority needs across the Pacific and Atlantic basins for these fisheries sustainability strategies.

Bites, Biomass, and Benthic Health: Scaling Herbivore Management Across Reef Ecosystems

It is generally accepted that herbivorous fish like parrotfish and surgeonfish can graze down competing algae on reefs, creating space for corals to settle and grow. A project funded by the Coral Program evaluated whether herbivore-focused management strategies in West Maui, Hawai‘i enhance vital ecosystem functions, such as algal grazing and corallivory by these types of reef fishes.

Building on years of surveys in Hawai‘i’s Kahekili Herbivore Fisheries Management Area (KHFMA) and Pacific-wide data collected as part of the National Coral Reef Monitoring Program (NCRMP), this project produced:

- Publicly archived survey data from KHFMA,
- A published peer-reviewed study in *Ecosphere* detailing a fish abundance-to-grazing conversion method,
- A published Standard Operating Procedure (SOP) for quantifying corallivory using Structure-from-Motion (SfM) benthic imagery, and,
- A collaborative workshop with management and restoration partners.

The project assessed whether marine protected areas, like KHFMA, translate increased fish abundance into enhanced functional grazing. It pinpoints which specific fish species and size classes contribute most significantly to reef resilience, bioerosion, and overall benthic health, which in turn supports management decisions like size and bag limits, spatial management, and more.

Both the conversion model and the SfM image-annotation SOP provide marine managers with scalable, standardized protocols to assess ecosystem processes, track Marmine Protected Area effectiveness, and inform localized restoration efforts. While validated for the U.S. Pacific Islands using NCRMP data, the conversion model and the SfM image-annotation SOP can be applied by marine managers worldwide.

School of convict tang or convict surgeonfish (*Acanthurus triostegus*) in the Northwestern Hawaiian Islands, Papahānaumokuākea National Marine Sanctuary. Credit: NOAA

Deep Reefs, Clearer Data: Transforming Caribbean Stock Assessments from the Bottom Up

This Coral Program-funded project piloted a Deep Coral Reef Monitoring Program (DCRMP) to expand fishery-independent surveys into upper mesophotic depth zones (30–50 meters) in the U.S. Virgin Islands. The project completed 345 deep-water visual surveys, filling a critical ecological data gap across the region's continuous reef tract. It also produced a publicly available dataset and two peer-reviewed publications detailing survey feasibility and management implications and fish community drivers.

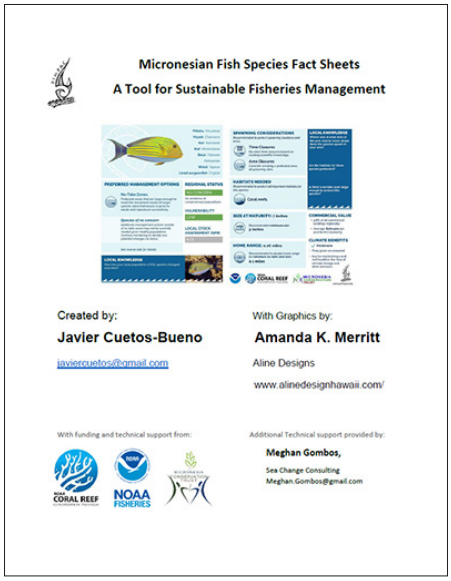
By gathering reliable data on fish size, abundance, and species richness, DCRMP overcomes the limitations of fishery-dependent reports. It provides vital stock assessment metrics for data-poor commercial species (such as snappers and groupers) and protected species like the threatened Nassau grouper. Crucially, these data directly filled major data gaps in the 2024/2025 yellowtail snapper stock assessment.

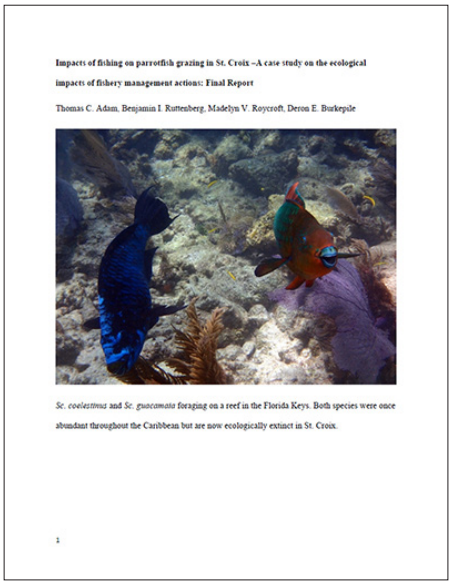
Built directly upon the established National Coral Reef Monitoring Program framework, the project demonstrates how specialized deep-water diving protocols can seamlessly expand shallow-water monitoring into mesophotic zones. This scalable survey design and its length-based assessment methodology can be readily adapted by fisheries managers in other marine geographies facing similar deep-water monitoring gaps. NOAA Fisheries plans to replicate these surveys in the U.S. Virgin Islands and Puerto Rico in 2027, indicating the utility of this kind of information for future stock assessments and other management decisions.

A scientist swims with a safety line and decompression cylinder while surveying deep reefs (30–50m) in the U.S. Virgin Islands. Credit: University of Virgin Islands

Products

The featured publications below highlight Coral Program projects that advanced fisheries sustainability during the implementation period. Our work fills critical information needs and provides managers with the science, tools, and technical assistance needed to inform their decisions.





Looking ahead, the Coral Program will build off the progress made during this time as we align our program capacity and capabilities to carry out the National Coral Reef Resilience Strategy with our partners.

For more information about NOAA's Coral Reef Conservation Program, visit coralreef.noaa.gov and coralreef.noaa.gov/digital-corals, or contact us at coralreef@noaa.gov.