CORAL REEF RESTORATION PLANNING & IMPLEMENTATION IN THE PACIFIC

A Partnership between NOAA & The Nature Conservancy (TNC)
Summary of Year 1 Progress and Year 2 Projects
November 2020

Active coral reef restoration is relatively new in the Pacific, where the focus of management has been on reducing local stressors to improve reef resilience. Reducing local stressors remains a critical component of effective reef management, and active restoration is an important additional tool to restore coral reef ecosystems and enhance resilience. Restoration plans are needed to guide development, testing and evaluation of strategic, science-based restoration projects, as is focused support for in-water restoration trials.

PROJECT SUMMARY

NOAA and TNC have teamed up through a five-year cooperative agreement to work with the four Pacific island jurisdictions of Hawai'i, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands (CNMI) to initiate coral restoration through: 1) Restoration Planning and Technical Assistance for all four US-affiliated Pacific jurisdictions, 2) Scientific Assessments to Target Restoration in Hawai'i, and 3) Implementation and Evaluation of Restoration in Hawai'i. While the science and restoration components of this project will focus on the main Hawaiian Islands, these activities and lessons learned can serve as a catalyst for effective restoration in the other U.S. jurisdictions, giving the project greater reach and a lasting legacy.

During the first year of this project (October 1, 2019-September 30, 2020), NOAA and TNC have supported each of the four Pacific Island jurisdictions in the development of climate-resilient restoration plans using the newly-published *Manager's Guide to Coral Reef Restoration Planning & Design*. In Year 2, we will provide targeted follow-up training, technical assistance, and learning exchanges for managers in each jurisdiction, and develop the information and support needed to initiate pilot projects in Hawai'i in Years 3 and 4.

YEAR 1: DEVELOP FOUR DRAFT RESTORATION PLANS

To start the planning process, TNC and NOAA worked with experts to identify and summarize relevant findings and best practices for restoration methods. We also worked with SymbioSeas to compile and synthesize existing assessments of resilience, climate vulnerability, and coral reef condition from each of the four Pacific Island jurisdictions.

Over the past year, each jurisdiction assembled a planning team of local experts who have 1) selected a restoration goal, 2) identified potential restoration areas of interest, and 3) evaluated and selected potential restoration interventions, all based on their unique biological, social, political, and cultural contexts. Planning teams received coaching and both written and discussion-based feedback throughout these steps from expert mentors, team coaches, and Reef Resilience Network staff.

Step 1: Restoration Goal Setting (see sidebar)

DRAFT GOALS OF EACH JURISDICTION

AMERICAN SAMOA

Reef communities in acutely impacted areas will be restored to promote recovery of reef function.

CNMI

Within 20 years, reef structure is restored or enhanced on Saipan's western side to reduce wave energy that threatens coastal infrastructure, improving the CNMI's resilience to sea level rise and increased storm events.

GUAM

The structure and function of coral reef communities are restored to enhance reef resilience to thermal stress.

HAWAI'I

Develop and test methods to restore corals lost from bleaching events to enhance the future resilience of coral reef ecosystems.

Step 2: Restoration Areas

To inform Step 2, SymbioSeas conducted an extensive modeling process to evaluate potential coral restoration areas for likelihood of coral survivorship (vulnerability assessment) and probability of restoration project success. This process integrated three key vulnerability factors using available data for each candidate reef region identified by the planning teams in Step 1, and included an evaluation of 1) future climate vulnerability using projected future exposure to bleaching conditions; 2) reef resilience using available data for coral and macroalgal cover, reef builder ratio, herbivore biomass, and temperature variability; and 3) cumulative human impacts using the human impacts index (developed by Wedding et al. 2018). This modeling process identified top-ranking candidate coral restoration areas across the selected reef regions.

Step 3: Restoration Interventions

Step 3 of the *Manager's Guide* planning process helped the teams identify, evaluate, and select active restoration interventions based on the *National Academy's Review of Coral Interventions* and other available resources. In this step, planning teams brainstormed an array of possible options for interventions that supported their priority goal. They then addressed questions, such as which techniques and coral species to use, to design interventions that also consider climate change projections. In a final step, teams compared the different interventions by evaluating their effectiveness, feasibility, urgency, flexibility, and other externalities, and then selected interventions to implement.

YEAR 2: COMPLETE RESTORATION ACTION PLANS

In Year 2, each team will complete a draft plan, vet it with local resource agencies and constituencies, and finalize a Restoration Action Plan.

Step 4: Metrics and Outreach

In Step 4, planning teams will define performance metrics and develop SMART objectives that will be used to measure progress towards their goal. They will identify the management and community engagement needed to implement their restoration efforts and develop timelines for their work. In the final phase of the project, they will also synthesize the information from Steps 1-4 in a Restoration Action Plan for their jurisdiction. These plans will be used to guide active restoration in the jurisdictions, apply for funding to initiate restoration activities, and monitor and evaluate restoration success.

TNC and NOAA will provide post-workshop support throughout Year 2 to help managers refine their plans, make progress on restoration activities, engage experts to address implementation challenges, and foster regional exchanges. Through these post-workshop consultations, we will continue to assess the needs of managers to effectively implement restoration to inform the design process and future workshops, exchanges, and capacity development activities.


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ADDITIOAL YEAR 2 ACTIONS IN HAWAI'I

In Year 2, we will identify and gather additional information needed for restoration site selection within the larger areas of interest identified in Step 2, and for specific interventions identified in Step 3 for each restoration site. We will also begin the permitting process so that we can implement pilot projects in Years 3 and 4 of this cooperative agreement.

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