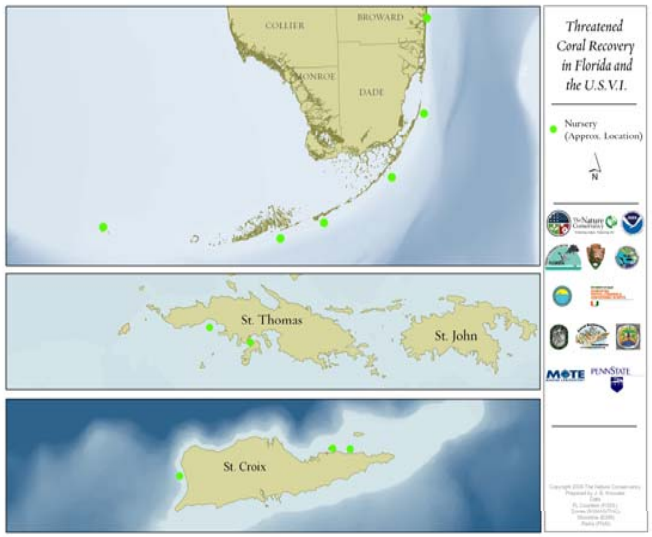
Threatened Coral Recovery and Restoration in Florida and the U.S. Virgin Islands

Need for Restoration

Throughout Florida and the Caribbean, the reef-building staghorn (*Acropora cervicornis*) and elkhorn (*Acropora palmata*) corals have experienced a significant and catastrophic decline since the late 1970's. Due to their importance as a fast-growing reef builder, they were listed as threatened species under the Endangered Species Act in 2006.

Project Overview

This project is helping to restore natural acroporid communities through the maintenance and establishment of nurseries in Florida and the USVI. Nurseries are being maintained and established within eight distinct subregions with the purpose of propagating the species and creating as many new colonies as feasible given limits on resources. Each of these nurseries is being managed and maintained by TNC or one of our partners: University of Miami, Nova Southeastern University, Coral Restoration Foundation, Inc., Florida Fish And Wildlife Conservation Commission, and Mote Marine Laboratory. Nursery-reared corals will eventually be transplanted onto reefs that are known to have supported acroporid communities, with the hope that these corals will contribute to the reseeding of natural reefs.



Project Objectives

The aim of this project is to enhance degraded coral reefs throughout Florida and the U.S. Virgin Islands. Our long-term goal is to increase acroporid larval production and genetic diversity by increasing the likelihood of successful cross-fertilization between genetically distinct colonies located on outplanted restoration sites. In order to reach this goal, at least 12,000 coral colonies will be grown out in nursery and transplanted onto at least 34 depleted reef sites, resulting in an overall minimum direct restoration area of 3400 square meters.

Methods

Set-up. Nurseries are installed using methods to elevate coral fragments off the sea floor. This may take the form of concrete cinder blocks, artificial reef structures, or line nurseries, all of which are being implemented by our partners.

Collection. Collections at each nursery will be taken from 20 different parent colonies. All corals are collected from healthy wild acropora colonies and taken straight to the nursery for installation. Parent colonies have been shown to heal quickly and fragments have high survival rates in the nurseries.

Monitoring and Maintenance. Both parent colonies and nursery fragments are monitored for survivorship, presence/absence of disease, bleaching, breakage, and predation.

Outplanting. Outplanting will be conducted according to a Plan that will be developed as a joint effort between the project partners and regulatory agencies.

Challenges

The main challenges faced in the first year of production have been weather-related. In winter 2010, a cold weather event caused significant impacts to reefs throughout the Florida Keys. The three Florida Keys nurseries lost nursery fragments as a result of this weather. Additionally, some of the parent colonies that had been identified as viable donors were lost.

In late August 2010, Hurricane Earl made landfall in the U.S. Virgin Islands. The two nurseries in St. Thomas were heavily impacted by this storm, with one losing about 72% of the coral fragments present.

Management Implications

This project represents an active form of coral reef management. The end goal is to strategically outplant at least 5,000 healthy coral colonies to reefs that once supported large thickets of acroporid corals throughout South Florida, the Florida Keys, and the U.S. Virgin Islands. Through careful site selection and outplanting design, this project could help to increase the chances of successful sexual reproduction, thereby encouraging the reseeding of natural coral reefs. Additionally, the nurseries may serve as a repository of genotypes, as was the case this winter when fragments in the nursery survived even as their wild parent colonies died due to the cold water.

As the first project of its size in the U.S., this project is laying the groundwork for future large-scale coral restoration projects. The lessons learned can be carried forward to continue to improve our understanding of active coral restoration.

Project Partners