Acropora cervicornis restoration: Coral Restoration Foundation’s 7 year summary for the Upper Keys

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Why Restore Coral Reefs?

- Provide protection and life support for countless species, including humans\(^2\)

- Coral Reefs are valued at $375 billion a year\(^1\)

1 billion people in 100 countries are estimated to be dependant on food and/or income from coral reefs\(^2\)

\(^1\)Costanza et al. 1997, \(^2\)Mastny 2001
Coral Restoration Foundation

- Non-profit, 501 C (3) based in Tavernier, FL
- Develops practical solutions for restoring coral reef
- Uses volunteers to help maintain & transplant corals from off-shore nurseries to reefs
- Specializing in restoring threatened staghorn (Acropora cerviconis) & elkhorn corals (Acropora palmata)
Nursery Methods

- Organized by genotype = row
- Platforms anchored by rebar rod
- Corals pruned once/year
- Trimmed fragments 2-3 cm
- Attached in epoxy to coral mount
- Maintained (algae removal) until needed to transplant
- Current size: 6000+ colonies representing 65 genotypes
Restoration Methods

- Transplant 1 year old corals
- Arranged in groups with 3 different genotypes (triad)
- Reef surface scraped to white limestone in attachment area
- Concrete base attached and covered with epoxy to reef
- Periodic maintenance
- Annual measurements
Restoration Site Locations
2003 Restoration Sites

- Molasses Reef
- Wellwood Site

Total corals planted: 6

NMS Boundary

Atlantic Ocean

Florida

Gulf of Mexico

Staghorn Nursery

Molasses Reef

CRF

Gulf of Mexico
2007 Restoration Sites

Molasses Reef

Florida

Gulf of Mexico

Staghorn Nursery

Total corals planted: 24

NMS Boundary

Atlantic Ocean
2008 Restoration Sites

Dry Rocks site 1

Total corals planted: 250
2009 Restoration Sites

Dry Rocks Site 2

Total corals planted: 508
2010 Restoration Sites

Davis Reef Site 1

Total corals planted: 628
Restoration Success

July 2007

December 2007

July 2008

January 2009

August 2009

Spawning 2009
Results: Growth comparison among sites planted from 2007-2010
Restoration Challenges

- Cold Stress
- Stunted Growth
- Damselfish Damage
- Disease
- Snail Damage
- Worm Damage
Results: Survival comparison among sites planted from 2007-2010
Summary

- Acropora is an excellent model species for coral restoration
- Fast growth rates allow coral to reach transplant size in 1 year
- Transplanted corals have high survival rates long term
- Effectiveness of planting genetically diverse groups was observed within 2 years = spawning
- Methods are simple, cost effective, and easy to replicate, however site selection and management are key
- Success of these restorations has lead to seascape scale restoration opportunities
COASTAL RESTORATION at work

THREATENED CORAL RECOVERY AND RESTORATION

FLORIDA AND THE U.S. VIRGIN ISLANDS

THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

COASTAL RESTORATION AT WORK ◆ CREATING JOBS FOR AMERICA ◆ RESTORING HABITAT FOR FISH AND WILDLIFE
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- Sanctuary Friends Foundation
- Ocean Reef Conservation Association
- Islamorada Fishing Club (IFACT)
- Sealife Inc.

Partners
- Florida Keys National Marine Sanctuary
- Florida’s Fish and Wildlife Commission
- Keys Marine Lab
- Coral Shores High School
- Island Christian School
- Florida Keys Dive Center
- Amoray Dive Resort
- Ocean Quest Dive Center
- REEF
- Rainbow Reef Dive Center
- Atlantis Dive Center
- Sundowners
- Keys Diver
- Quiescence
- Forrest Tek Lumber
- Holiday Inn