

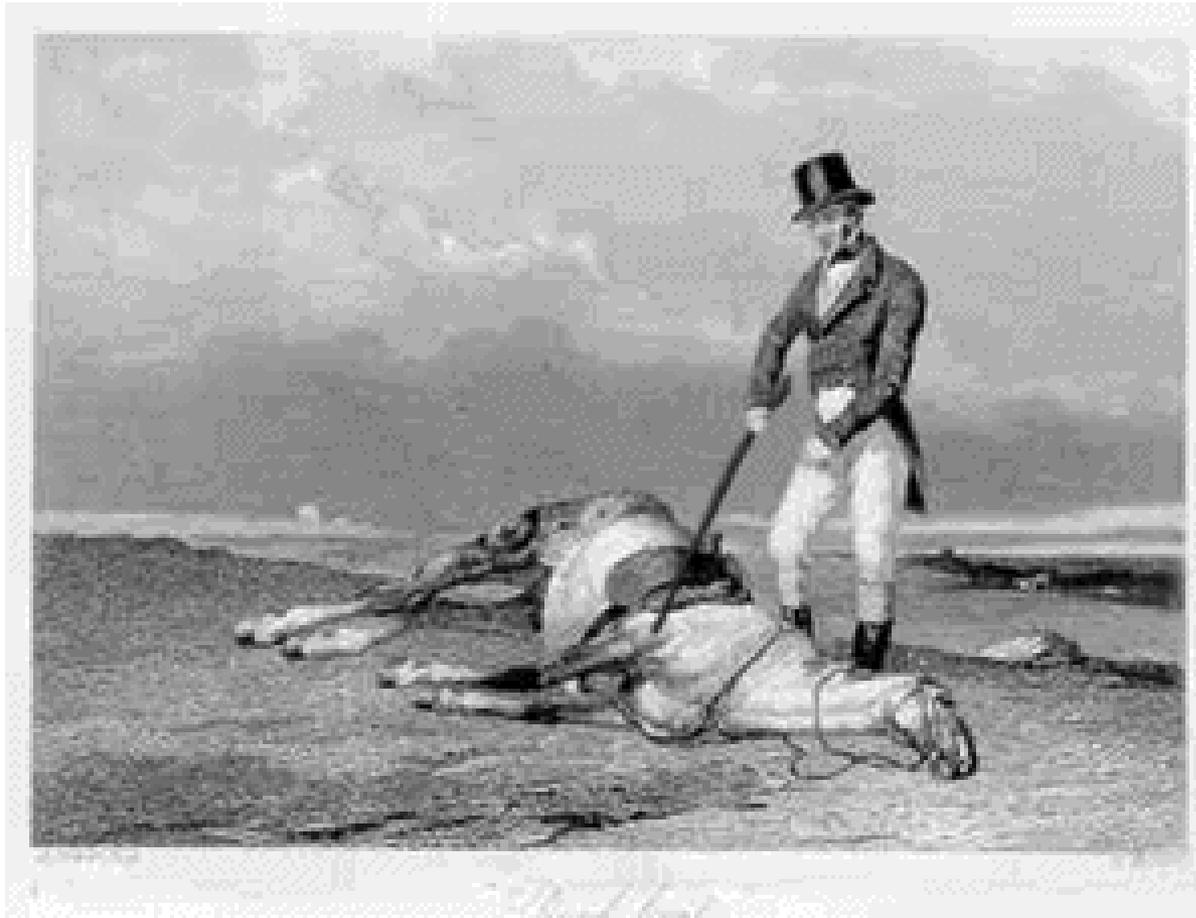
# Coral Reef Ecosystem Restoration Work Group:

## FKNMS Restoration Zones and Activities



Bill Goodwin  
Sanctuary Resources Manager  
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Staff Support Lead

# Florida Keys National Marine Sanctuary Zoning Review



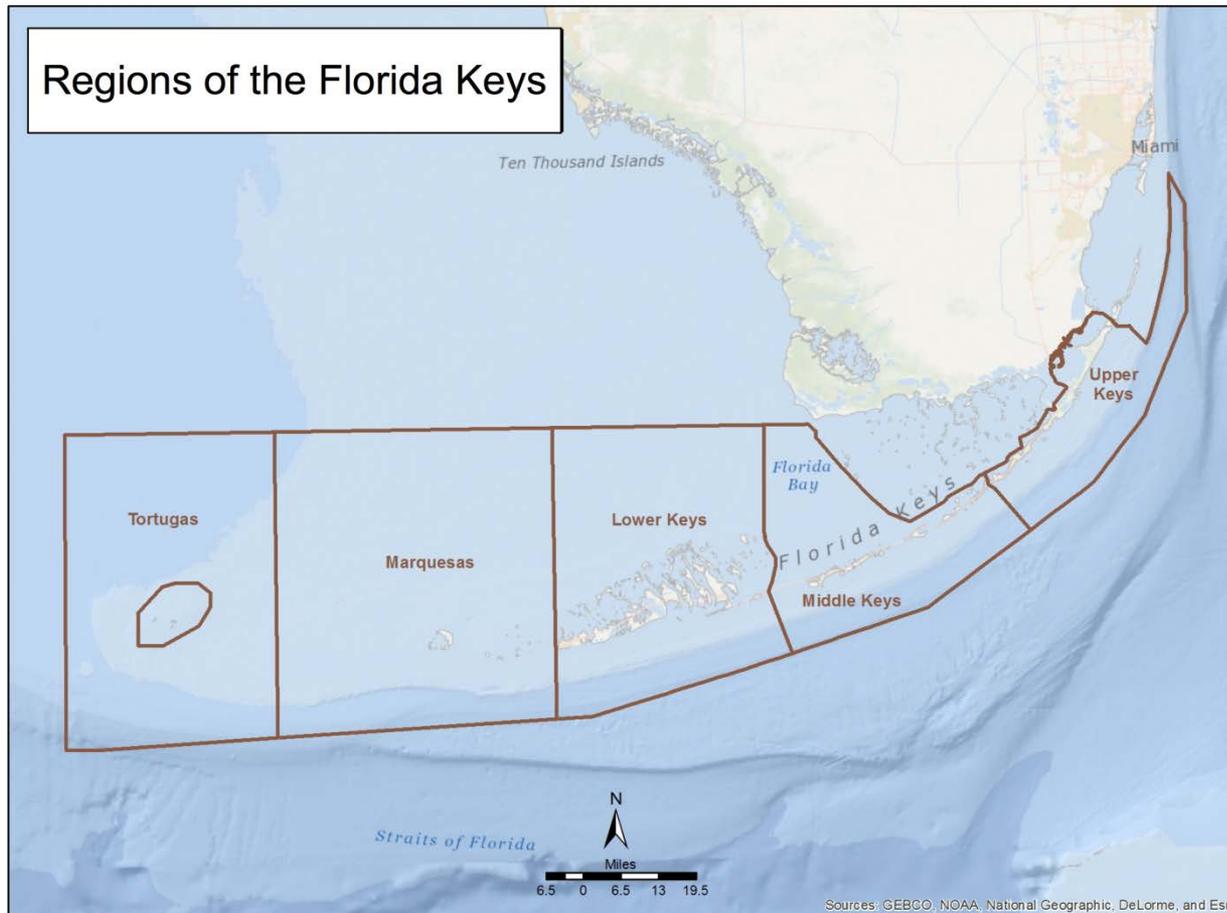
# Coral Reef Ecosystem Restoration Objectives



- Identify specific areas and zones for active restoration of coral reef ecosystem.
- Identify regulatory impediments and appropriate permitting conditions for active restoration of coral reef ecosystem species.
- Identify adaptive management measures and criteria for opening area closed for restoration purposes.



# Coral Reef Ecosystem Restoration Zones within FKNMS



# Coral Reef Ecosystem Restoration Zones within FKNMS

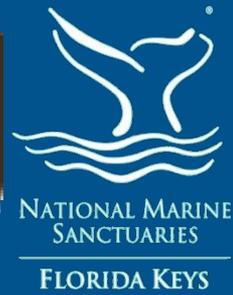


Surprise!!! There aren't any (currently)!



Although considered, adopted and codified in original FKNMS regulations, none have been implemented to date

# Florida Keys National Marine Sanctuary Zoning Review

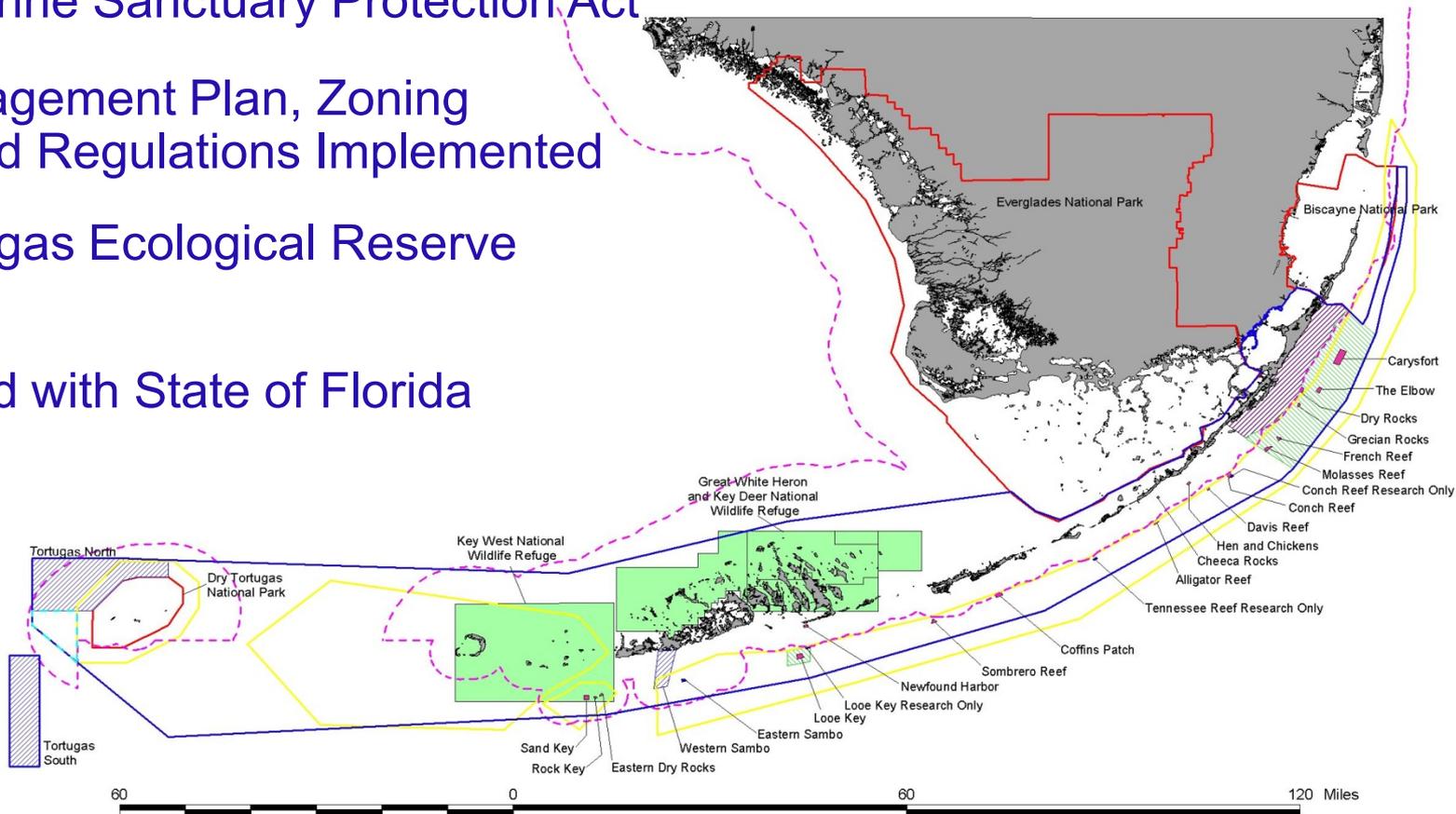


1990 - Congress passed Florida Keys National Marine Sanctuary Protection Act

1997 - Management Plan, Zoning Scheme, and Regulations Implemented

2001 - Tortugas Ecological Reserve added

Co-Managed with State of Florida (DEP/FWC)



# What types of things do the Sanctuary and Refuge regulate?



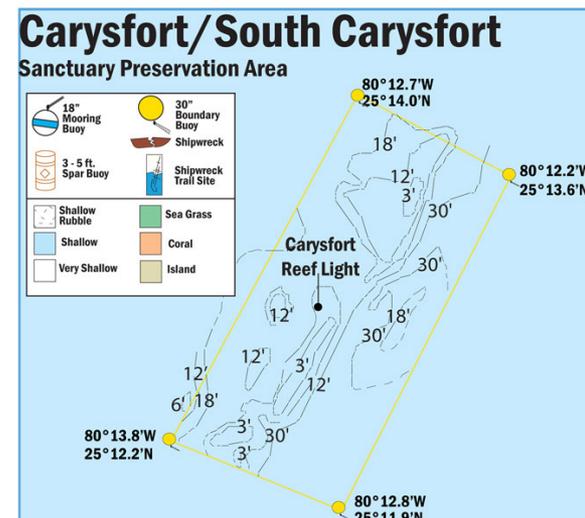
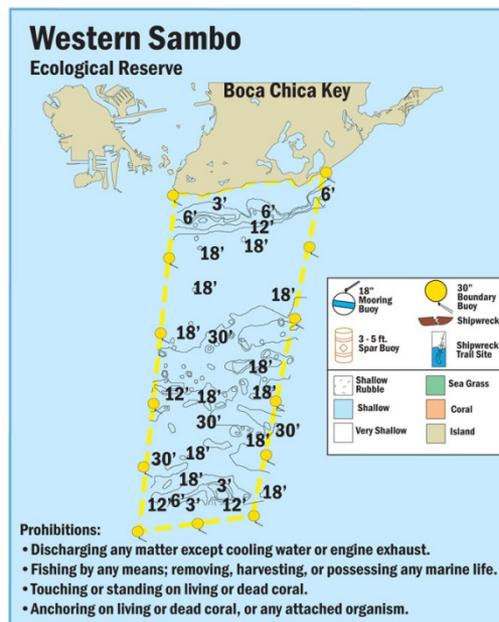
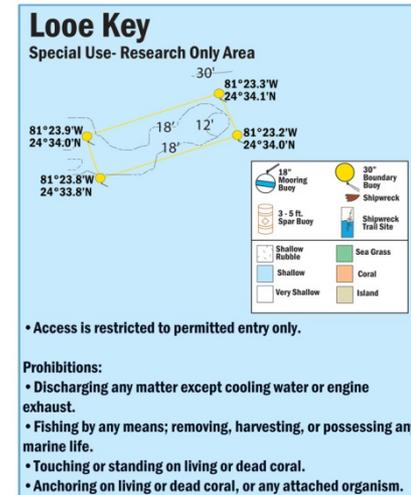
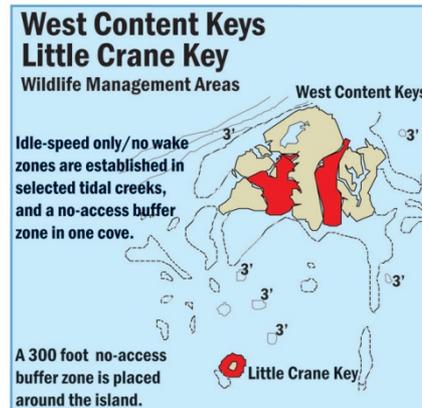
- Dumping / Discharges
- Spearfishing
- Fishing
- Vessel Speed
- Personal Watercraft
- Vessel Access
- Groundings
- Marine Construction & Dredging
- Oil and Gas Development
- Touching / Standing on Coral
- Diving / Snorkeling
- Marine Life / Aquarium Collection



# Marine Zoning for User Conflicts and Resource Protection



- Sanctuary Preservation Areas (SPAs) and Ecological Reserves (ERs) – No Take Areas
- Wildlife Management Areas (WMA) – Access and Boating Restrictions
- Existing Management Areas (EMA) – Previously Designated Zones / Regulations
- Special Use Areas – Research Only



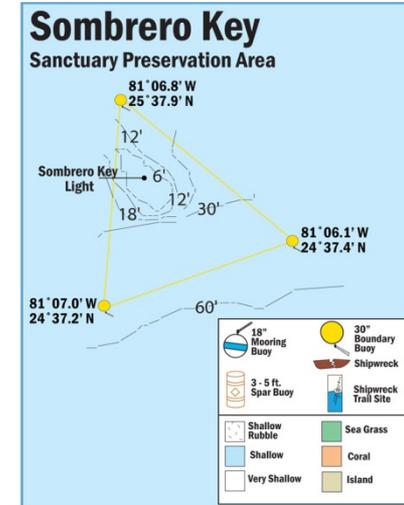
# Sanctuary Preservation Areas (SPAs)



- 18 SPAs within FKNMS covering approximately 5 sq nm
- Protect shallow reefs along the reef tract
- Encompass discrete, biologically important areas
- Help sustain critical marine species and habitats

## Prohibited Activities:

- Discharging any matter except cooling water or engine exhaust.
- Fishing by any means; removing, harvesting, or possessing any marine life. Catch and release fishing by trolling is allowed in Conch Reef, Alligator Reef, Sombrero Reef, and Sand Key SPAs only.
- Touching or standing on living or dead coral.
- Anchoring on living or dead coral or any attached organism.
- Anchoring when a mooring buoy is available.
- Bait fishing is allowed in SPAs by FKNMS-issued permit



# Ecological Reserves (ERs)



- 2 Ecological Reserves in FKNMS
  - Western Sambo ER
  - Tortugas ER (Tortugas North and Tortugas South)
- Largest of the sanctuary zones
- Protect large, contiguous, diverse habitats over representing an entire range of marine habitat types
- Protect natural spawning, nursery, and permanent-residence areas needed for sustainable populations of fish and other marine life
- Altogether encompasses nearly 160 square nautical miles

## **Prohibited Activities include:**

- Discharging any matter except cooling water or engine exhaust.
- Fishing by any means; removing, harvesting, or possessing any marine life.
- Touching or standing on living or dead coral.
- Anchoring on living or dead coral, or any attached organism.
- Anchoring when a mooring buoy is available.

# Ecological Reserves (ERs)

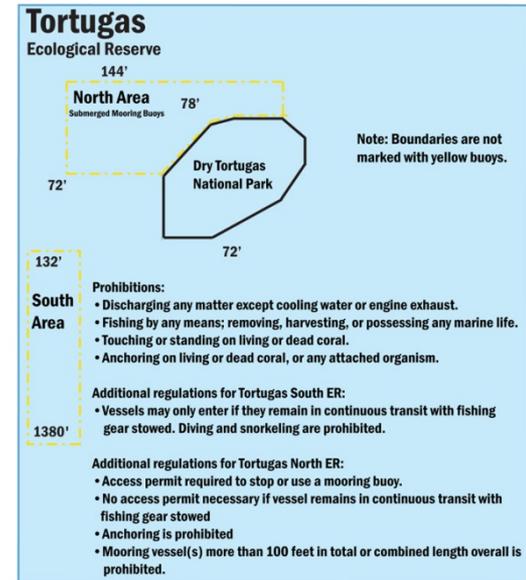


## Additional regulation for the Tortugas South Ecological Reserve:

- Vessels may only enter if they remain in continuous transit with fishing gear stowed (diving and snorkeling are prohibited)

## Additional regulations for the Tortugas North Ecological Reserve:

- Access permit required to stop or use a mooring buoy.
- Anchoring is prohibited.
- Mooring by vessel(s) more than 100 feet in total or combined length overall is prohibited.
- No access permit necessary if vessel remains in continuous transit with fishing gear stowed.



# Special Use Areas – Research Only



- 4 Special Use Areas- Research Only
- Set aside areas for scientific research
- No entry or activities without a permit from FKNMS
- Future Special Use Areas could be designated as restoration zones

## Prohibited activities:

- Discharging any matter except cooling water or engine exhaust
- Fishing by any means; removing, harvesting, or possessing any marine life
- Touching or standing on living or dead coral
- Anchoring on living or dead coral, or any attached organism



- Located at Conch Reef, Tennessee Reef, Looe Key (patch reef), and Eastern Sambo

# FKNMS Restoration Activities



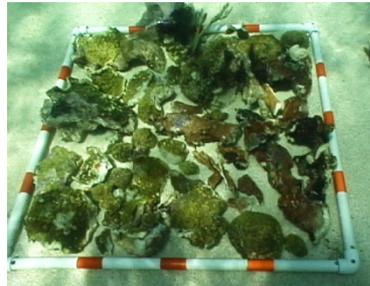
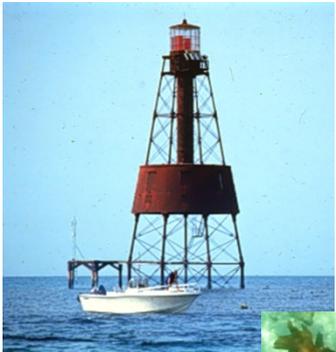
- Coral reef and seagrass habitat “repairs”
- Primarily “reactive” – in response to specific human impacts
- Have addressed vessel groundings for the most part
- Not ecosystem focused
- Occasional temporary closure zones around large restoration projects for duration of work only



# FKNMS Restoration Activities



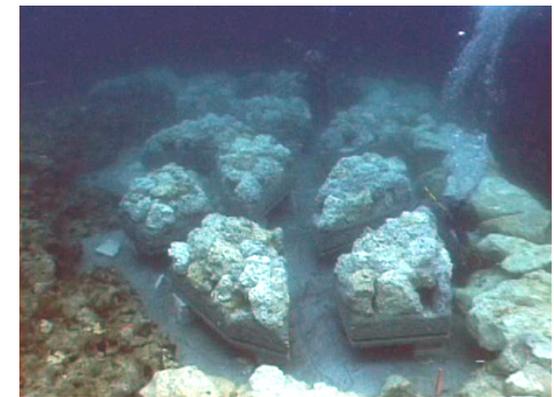
Coral reef restoration projects in response to small vessel injuries have typically involved triage of impacted resources and/or reattachment of broken/dislodged coral colonies



# FKNMS Restoration Activities



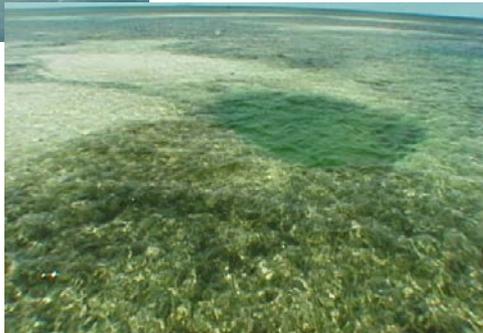
Coral reef restoration projects in response to large vessel injuries have typically involved structural restoration of reef framework and/or reattachment of broken/dislodged coral colonies



# FKNMS Restoration Activities



Seagrass restoration projects in response to vessel groundings have involved various combinations of sediment backfilling of excavations, planting unit transplants and/or installation of bird roost stakes



# FKNMS Restoration Activities



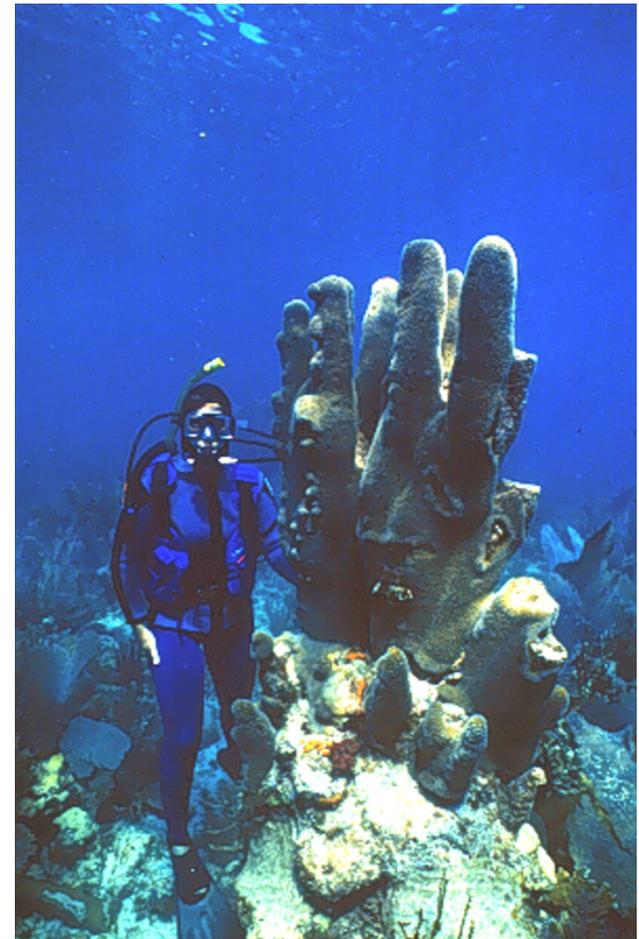
Occasionally, coral reef resources on man-made structures have been relocated to natural reef substrates, reef restoration sites or coral nurseries prior to initiation of construction, repair or removal projects



# FKNMS Restoration Activities



In some instances, large, long-lived coral colonies have been re-stabilized after having been toppled and overturned in the wake of major storms



# FKNMS Restoration Activities



Future activities may also include:

- exotic species eradication
- marine debris removal



# Florida State Parks Ecosystem Restoration Activities



- Numerous seagrass and coral reef restoration projects to address specific human impacts (primarily groundings)
- Some small scale outplanting of aquarium-grown *A. cervicornis* colonies in JPCRSP
- Several large-scale shoreline habitat restoration projects
- Currently, no zones in place specifically for ecosystem restoration



**Carysfort Marina Restoration: 27 Acres Completed**

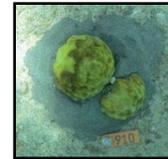
- 2001 Work Completed: 9.87 Acres
- 2004 Restoration of 12.41 acres
- 2010 Restoration: 4.93 acres
- 2010 Fill from FDOT Restoration of Lee Ryan Rd: 0.13 acre
- Basin Remaining to be Filled: 0.04 acre



# Biscayne and Dry Tortugas National Parks Ecosystem Restoration Activities



- Numerous seagrass and coral reef restoration projects to address specific human impacts (primarily groundings)
- Marine debris removal projects (2007 to present)
- Lionfish eradication programs (in-house & visitor)
- Efforts being made to restore storm-damaged reefs
- Currently, no zones in place specifically for ecosystem restoration



# NOAA/NMFS Coral Reef Restoration Research



- Developing effective ecological restoration techniques for degraded coral reefs
- Collecting, culturing, and settling broadcast-spawning coral larvae (*Acropora*, *Montastrea* and *Diploria*)
- Seeding of larvae onto dead *Acropora* skeletons and *Wellwood* restoration modules (Molasses Reef)
- Outplant of lab-settled spat onto reef restoration structures or natural reefs
- Work is permitted by FKNMS at sites located both inside and outside of SPAs



# Coral Restoration Foundation: USA



- Large-scale propagation of Acroporid coral fragments in seafloor nursery offshore of Key Largo
- Goal: Re-establish sexually mature coral colonies that can successfully reproduce and repopulate degraded reefs of Florida reef tract
- Established in 2000; began propagation of three genotypes of *Acropora cerviconis* (Staghorn Coral); now propagating/growing/outplanting *A. palmata* (Elkhorn Coral) and *Millepora complanata* (Fire Coral)
- 2004: funding through the NOAA-TNC Community-based Habitat Restoration Grant Program to initiate a pilot study in which corals were grown in the nursery and outplanted to Key Largo reefs after a year.
- Permitted by FKNMS to collect coral fragments at specific sites throughout Sanctuary, both inside and outside SPAs
- Permitted by FKNMS to perform large-scale outplanting at Molasses Reef SPA

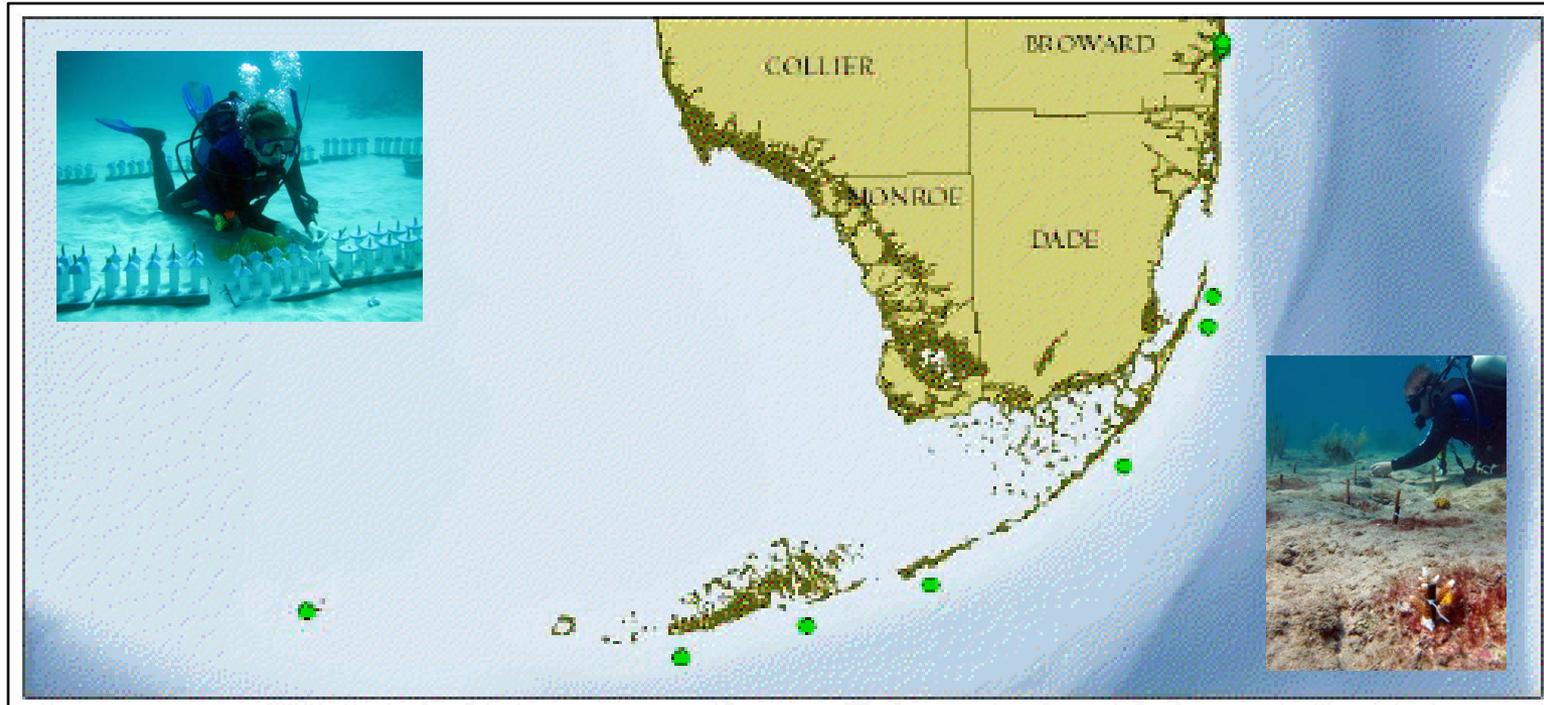


# The Nature Conservancy (TNC) Coral Restoration Program



- Funded in 2009 by NOAA's Restoration Center through the American Reinvestment and Recovery Act (ARRA)
- Large-scale propagation of Acroporid coral fragments in seafloor nurseries
- Resulting colonies outplanted on degraded natural reef areas in FL & USVI
- 5,628 *Acropora* colonies outplanted on Florida and USVI reefs in 2012
- Seven nurseries located within FKNMS:
  - ✓ Upper Keys Nurseries (2): managed by the Coral Restoration Foundation.
  - ✓ Middle Keys Nurseries (2): managed by the FL Fish and Wildlife Conservation Commission (FWCC).
  - ✓ Lower Keys Nursery (1): managed by Mote Marine Lab.
  - ✓ Key West Nursery (1): co-managed by Florida Keys Community College (FKCC) and Coral Restoration Foundation.
  - ✓ Dry Tortugas Nursery (1): managed by The Nature Conservancy. This site is within the Dry Tortugas National Park and is mostly funded by the National Park Service.

# The Nature Conservancy (TNC) Coral Restoration Program

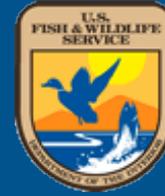


Locations of ARRA/TNC Coral Nurseries in South Florida

# Coral Reef Restoration Research



Numerous small-scale coral propagation, reproduction, and transplanting projects currently permitted within FKNMS, both inside and outside of SPAs



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