Coral Reef Ecosystem Restoration Work Group:

FKNMS Restoration Zones and Activities

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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

Regions of the Florida Keys

- Tortugas
- Marquesas
- Lower Keys
- Florida Keys
- Middle Keys
- Upper Keys

Sources: SEDAC, NOAA, National Geographics, DeLorme, and ESRI
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
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.
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.
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.
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
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
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 cervicornis* (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).
  - 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
Numerous small-scale coral propagation, reproduction, and transplanting projects currently permitted within FKNMS, both inside and outside of SPAs
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