Coral Reef Ecosystem Restoration Working Group: Recommendations to FKNMS SAC
Working Group Membership

Sanctuary Advisory Council Members

• Dave Vaughn (WG Co-Chair), Research and Monitoring
• Clinton Barras, Tourism – Lower Keys
• Alex Brylske, Education and Outreach
• Jeff Cramer, Fishing – Commercial (Fin/Shell)
• Don Kincaid, Diving – Lower Keys
• Rob Mitchell - Diving
• Martin Moe, Education and Outreach
• Bob Smith, Diving - Lower Keys
Working Group Membership

Community / Public Members

• Patti Gross, History of Diving Museum; USCG Auxiliary
• Caitlin Lustic, The Nature Conservancy
• Jeff Neidlinger, A Deep Blue Dive Center
• Marius Venter, Fury Water Adventures
Coral Reef Ecosystem Restoration

Objectives:

• Identify specific areas and zones for **active** restoration of coral reef ecosystems
• Identify regulatory impediments and appropriate permitting conditions for active restoration of coral reef ecosystem species
• Identify adaptive management measures for opening areas closed for restoration purposes
7 Working Group Meetings Over 6 Months

In Summary -

**January 31**: Clarified role and authority of working group; determined entire Florida Keys coral reef ecosystem would be considered in recommendation development

**February 21**: Identified habitats and resources to consider for active restoration; activities that may impact restoration

**March 13**: Identified criteria to use for developing options and recommendations; identified areas on charts to consider

**April 3**: Further refined selection criteria and areas to consider for recommendation as restoration areas
In Summary -

May 1: Reviewed individual maps for proposed coral reef ecosystem restoration and proposed additional new areas for restoration; discussed resources, purposes and intent of the sites, and activities that need to be managed.

May 22: Recommendations developed regarding streamlining permitting process, management options, area/zone marking, adaptive/flexible management and restoration research zones; reviewed and prioritized active coral reef ecosystem restoration areas.

June 12: Finalized area selections and draft recommendations to SAC regarding coral reef ecosystem restoration within FKNMS.
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Criteria used for area/zone selection:

- Likelihood of success
- Biodiversity and habitat
- Sustainability/connectivity
- Sufficient size
- Allowable/compatible uses
- Suitability as reference areas/monitoring sites
- Facilitation of enforcement and compliance
Objective 1:
Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Final restoration area/zone recommendations:

- entire FKNMS be eligible for coral reef ecosystem restoration activities
- selected a suite of 103 areas for restoration
- further prioritized those sites for a total of 37 Tier 1 (top priority) areas
- Tier 1 areas identified are general areas
- specific sites will be selected when actual restoration activities are conducted
- site size and type will be determined by the restoration goals and available funding
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Selected Areas</th>
<th>Tier 1 Areas</th>
<th>Coral Reef Habitat Type</th>
<th>Existing Management Area</th>
<th>Crawfish Trap Exclusion Zone</th>
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<tbody>
<tr>
<td></td>
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<td>Hardbottom</td>
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<td></td>
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<td></td>
<td>Inshore Patch Reef</td>
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<td>Mid-Channel Reef</td>
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<td>1</td>
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<td>2</td>
<td>0</td>
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<td>TOTAL</td>
<td>103</td>
<td>37</td>
<td>3</td>
<td>8</td>
<td>19</td>
</tr>
</tbody>
</table>
Objective 1:
Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

All Recommended Areas within FKNMS

- These are areas identified as high value sites that would benefit from active coral restoration work.
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Upper Keys Region

- Tier 1 areas are considered top priority areas for restoration work.
- Restoration work is not restricted to Tier 1 or “Other Areas”
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Middle Keys Region

- Tier 1 areas are considered top priority areas for restoration work.
- Restoration work is not restricted to Tier 1 or “Other Areas”
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Lower Keys Region

- Tier 1 areas are considered top priority areas for restoration work.
- Restoration work is not restricted to Tier 1 or “Other Areas”
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

The Marquesas

Tier 1 areas are considered top priority areas for restoration work.

Restoration work is not restricted to Tier 1 or “Other Areas”
Objective 1:
Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

The Dry Tortugas

Tier 1 Areas

Other Recommended Areas

- Tier 1 areas are considered top priority areas for restoration work.
- Restoration work is not restricted to Tier 1 or “Other Areas”
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Restoration activities within selected areas will include:

- active coral transplanting and stock enhancement - to recreate, initiate, accelerate, or augment the recovery of an ecosystem that has been degraded

- manipulative experiments - strategic science and manipulative experiments to advance the science of restoration
Management and access options could include

- open demonstration sites -
  - innovative partnerships
  - sponsorships (incentive sites)

- managed access sites -
  - managed activities within the site

- closed for research sites–
  - restricted access for research and control sites
  - closed to visitation
Objectives 1:
Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Develop incentive (sponsored) sites –

- may apply to all management/access options
- to promote a sense of ownership and stewardship
- to provide funding support for active restoration activities
  - donations
  - user fees
  - mooring buoy sponsorship
  - reef sponsorships
Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

Marking and mooring at coral reef ecosystem restoration areas could include:

• Site marker buoys –
  ✓ link access restrictions to specific marker buoys used rather than specific locations
  ✓ areas/sites can easily be moved as activities are shifted

• Manage the mooring buoys –
  ✓ no mooring buoys in areas that are closed to visitation
  ✓ limited number for incentive funding entities to utilize
  ✓ subsurface buoys for researchers/restoration practitioners and incentive access users
Objective 2: Identify Regulatory Impediments and Appropriate Permitting Conditions for Active Restoration of Coral Reef Ecosystem Species

- streamline the permit process
- allow for simple modifications
- develop an on-line permitting system that would allow all involved agencies to review applications
- create and utilize an interdisciplinary advisory committee to review permit applications
- consider use of the FKNMS permit through which “qualified” practitioners could operate (possibly under a manager’s or blanket permit)
- permitting should allow for development of innovative/adaptive restoration techniques
Adaptive management:

- systematic process for improving environmental management policies/practices
- emphasizes the need to change with the environment and to learn from doing
- will be applied to managing active coral reef ecosystem restoration areas within FKNMS
- used to change the status of existing areas/add new areas
- based on clear goals, objectives and adaptive management triggers

Objective 3: Identify Adaptive Management Measures and Criteria for Opening Areas Closed for Restoration Purposes
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Restoration/research goals & objectives:

- restoration areas will have clear goals and objectives

- goals and objectives are specific to each area and/or site

- intended to provide guidance for managing restoration areas and changing the management and access restrictions as appropriate
Objective 3:
Identify Adaptive Management Measures and Criteria for Opening Areas Closed for Restoration Purposes

Adaptive management triggers and criteria:

• development of new nursery and restoration technologies may allow more species to be restored and/or new types of restoration activities to be employed

• change in the listing of species under the Endangered Species Act (ESA)

• changes in the condition of the coral reef ecosystem

• measurable goals/objectives met

• restoration fails/site becomes unsuitable for further restoration
Objective 3: Identify Adaptive Management Measures and Criteria for Opening Areas Closed for Restoration Purposes

Possible adaptive management responses to triggers:

- Re-evaluate activities that could impact success of restoration activities
- Restrict access during times of restoration effort
- Restrict access to allow for undisturbed monitoring sites for research
- Lift restrictions
- Monitor restoration areas to understand contribution of various stresses to restored natural resources
Florida Keys National Marine Sanctuary Marine Zoning and Regulatory Review: floridakeys.noaa.gov
Maps, Data, and GIS Resources: http://ocean.floridamarine.org/fknms_zone_review
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Ken Nedimyer
Sanctuary Advisory Council Lead
Working Group Chair