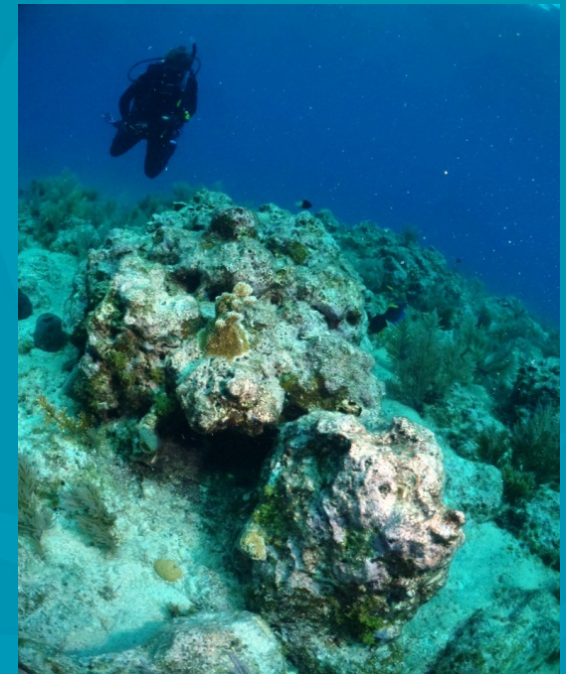


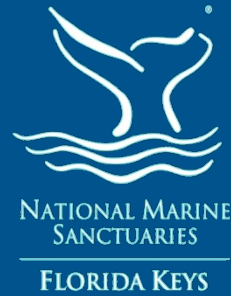


# Coral Reef Ecosystem Restoration Working Group: Recommendations to FKNMS SAC



Ken Nedimyer  
Sanctuary Advisory Council Lead  
Working Group Chair

# 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

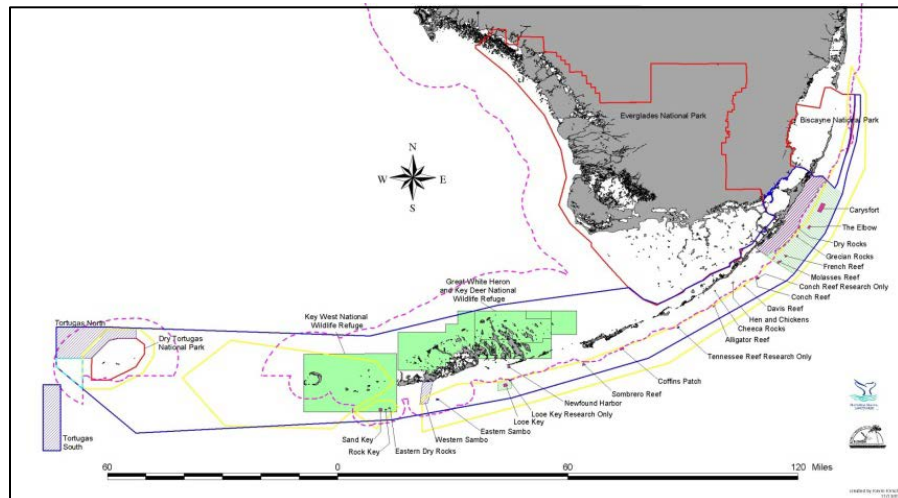


## Community / Public Members

- Patti Gross, History of Diving Museum; USCG Auxillary
- 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

# 7 Working Group Meetings Over 6 Months



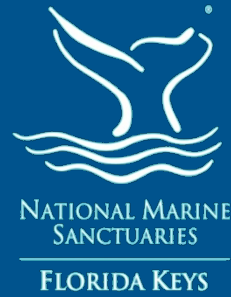
## *In Summary -*

**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

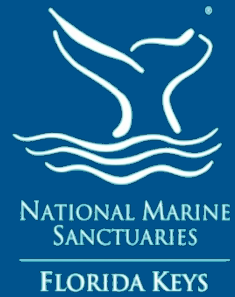


## Final restoration area/zone recommendations:

- 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

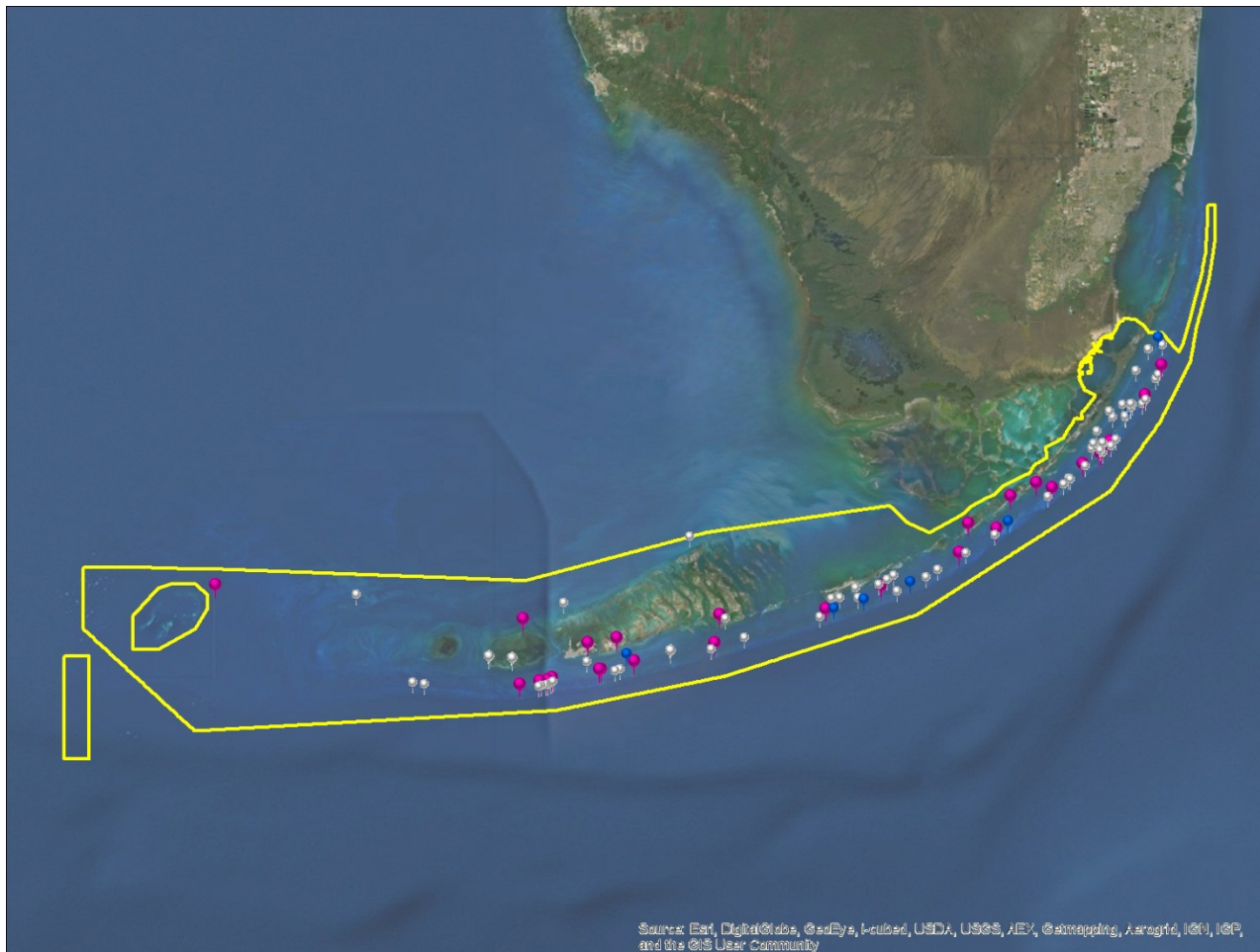


Region	Total Selected Areas	Tier 1 Areas	Coral Reef Habitat Type						Existing Management Area	Crawfish Trap Exclusion Zone
			Hardbottom	Inshore Patch Reef	Mid-Channel Reef	Offshore Patch Reef	Reef Margin / Fore Reef	Mixed / Transitional		
Upper Keys	39	8	1	0	9	5	24	0	20	32
Middle Keys	24	6	0	2	7	2	13	0	6	7
Lower Keys	27	11	1	4	2	1	12	7	11	12
Marquesas	10	4	1	2	1	0	4	2	0	0
Dry Tortugas	3	2	0	0	0	0	0	3	2	2
<b>TOTAL</b>	103	37	3	8	19	8	53	12	39	53

# Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems



## All Recommended Areas within FKNMS



**Tier 1 Areas**



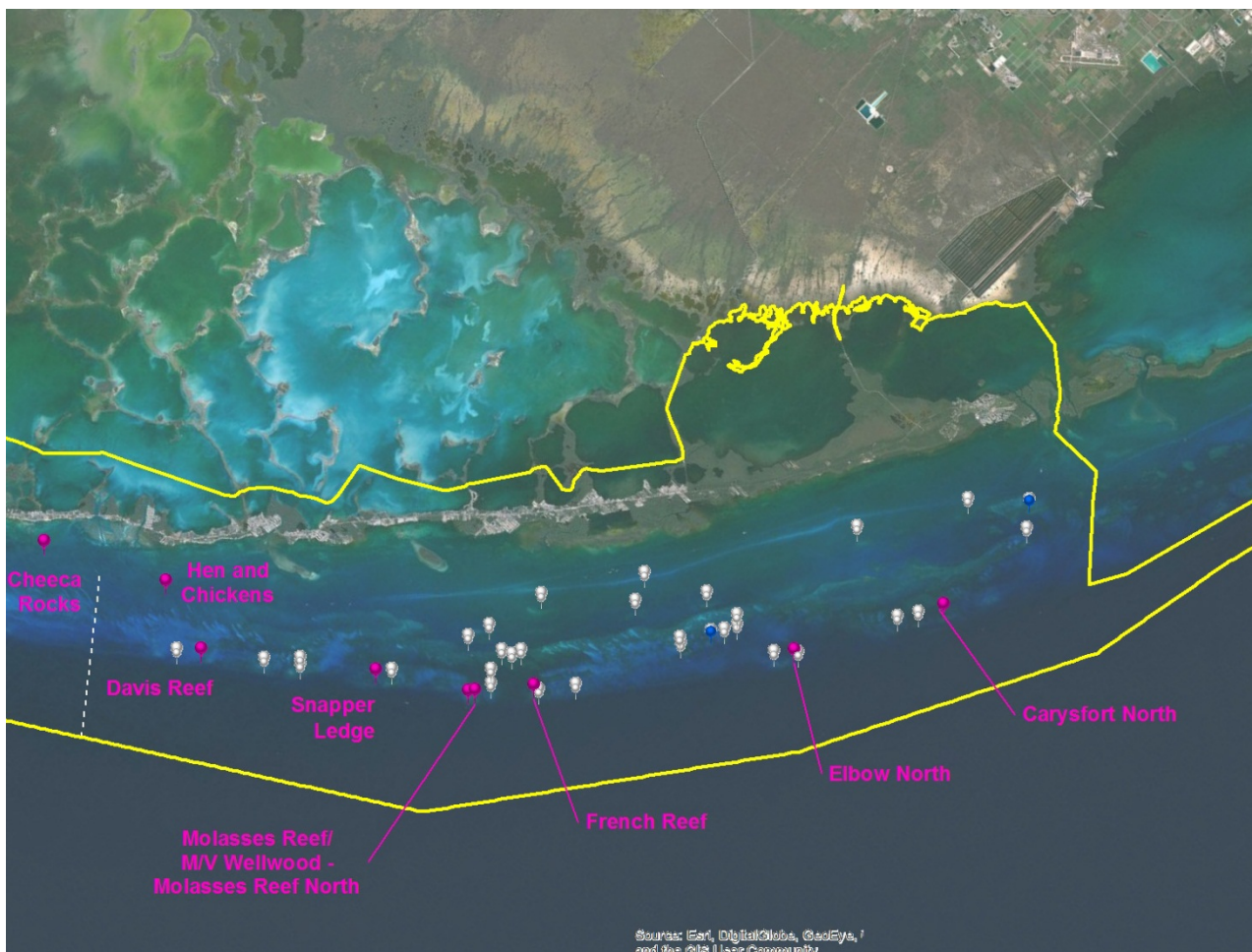
**Other Recommended Areas**

- 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



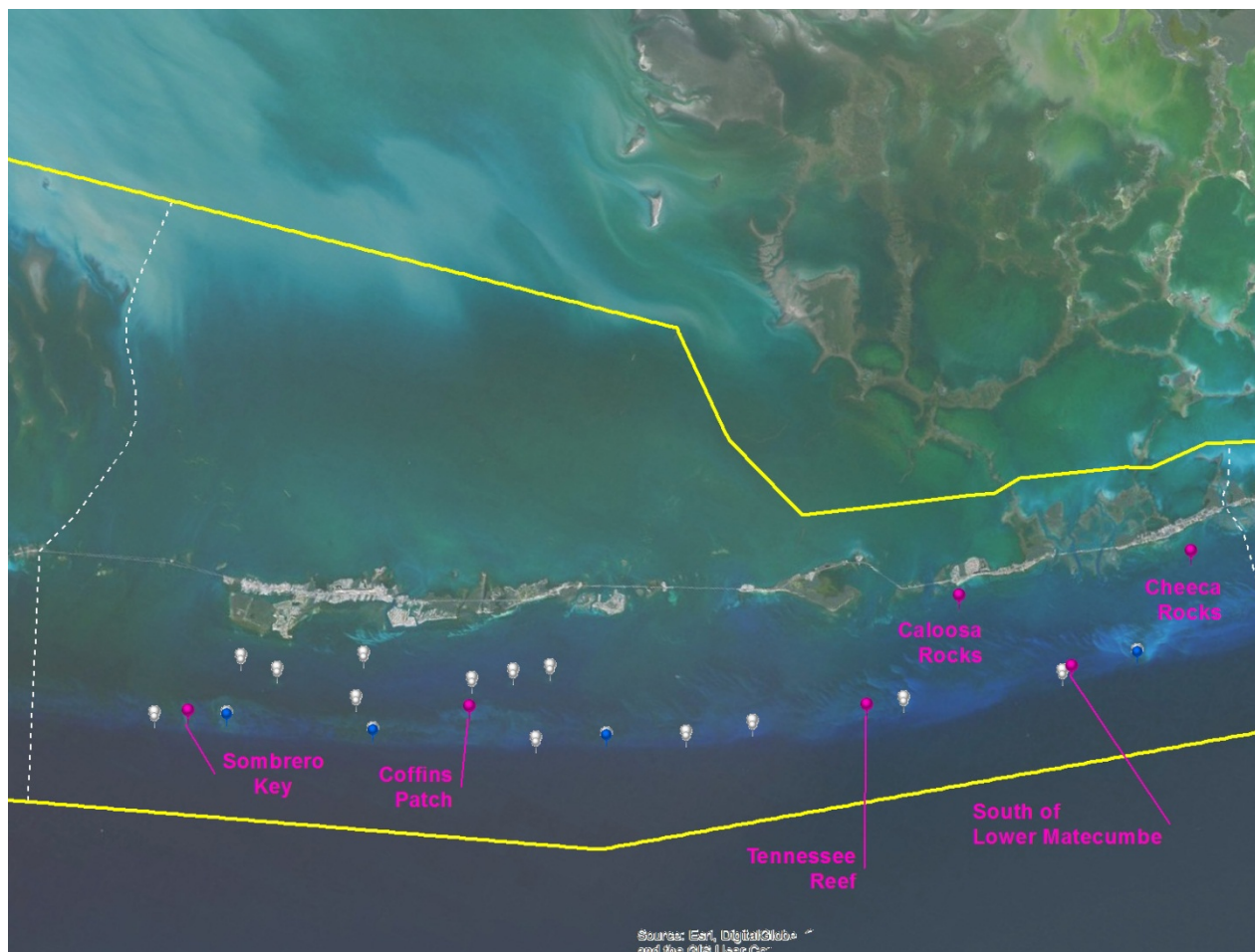
Other Recommended Areas

- 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



## Middle Keys Region



**Tier 1 Areas**



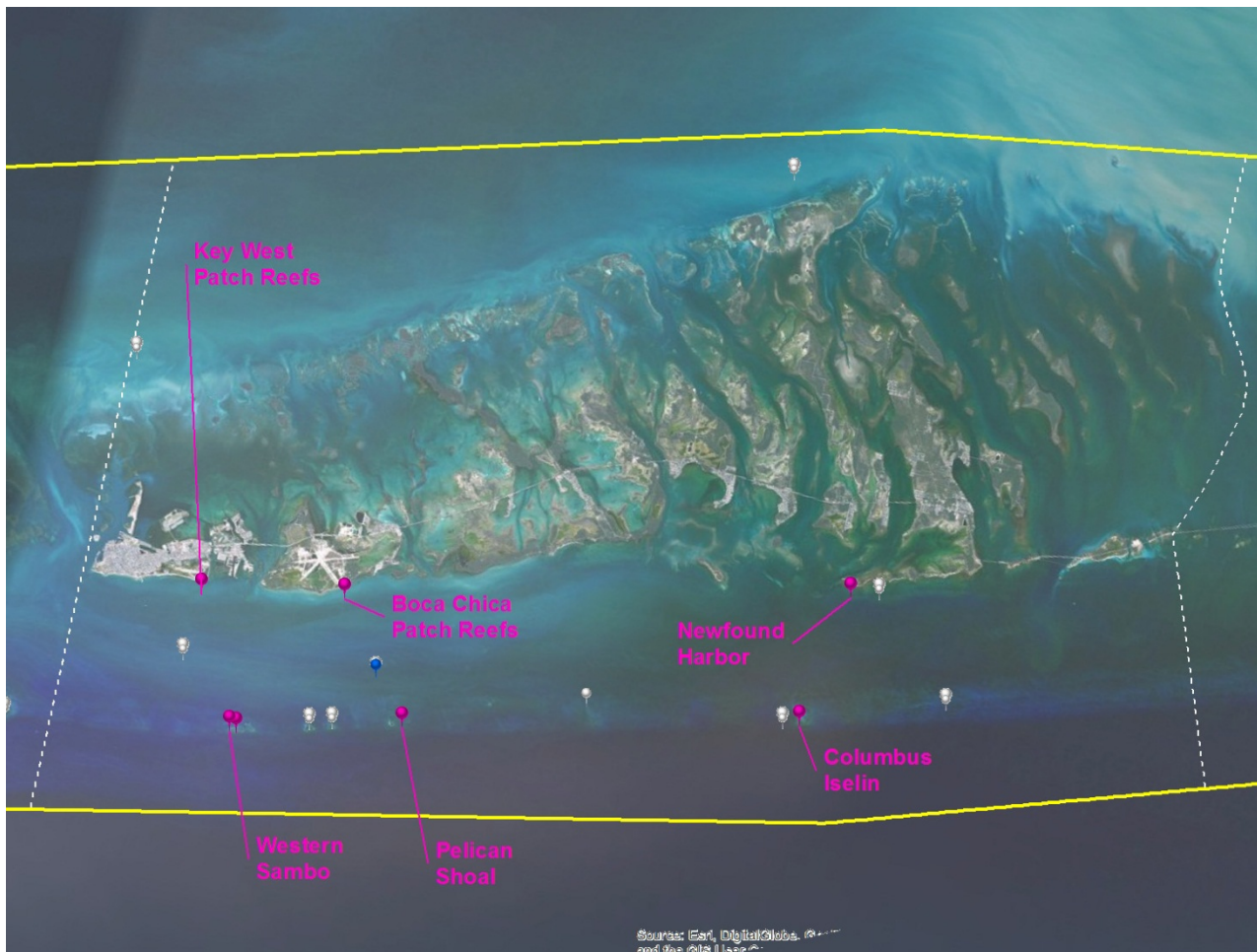
**Other Recommended Areas**

- 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



## Lower Keys Region



**Tier 1 Areas**



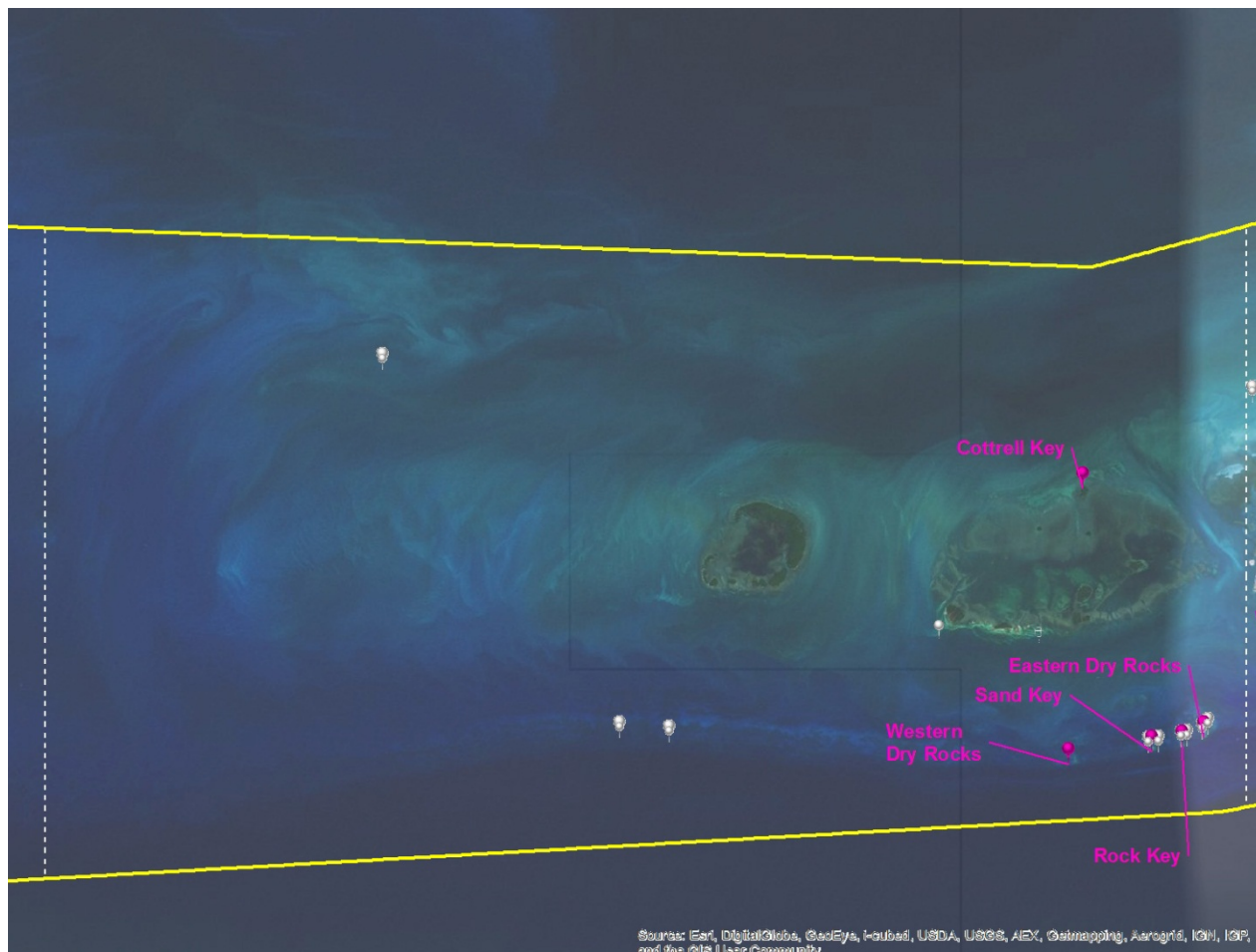
**Other Recommended Areas**

- 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



## The Marquesas



Sources: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, DeLorme, AeroGRID, IGN, IGP, and the GIS User Community



**Tier 1 Areas**



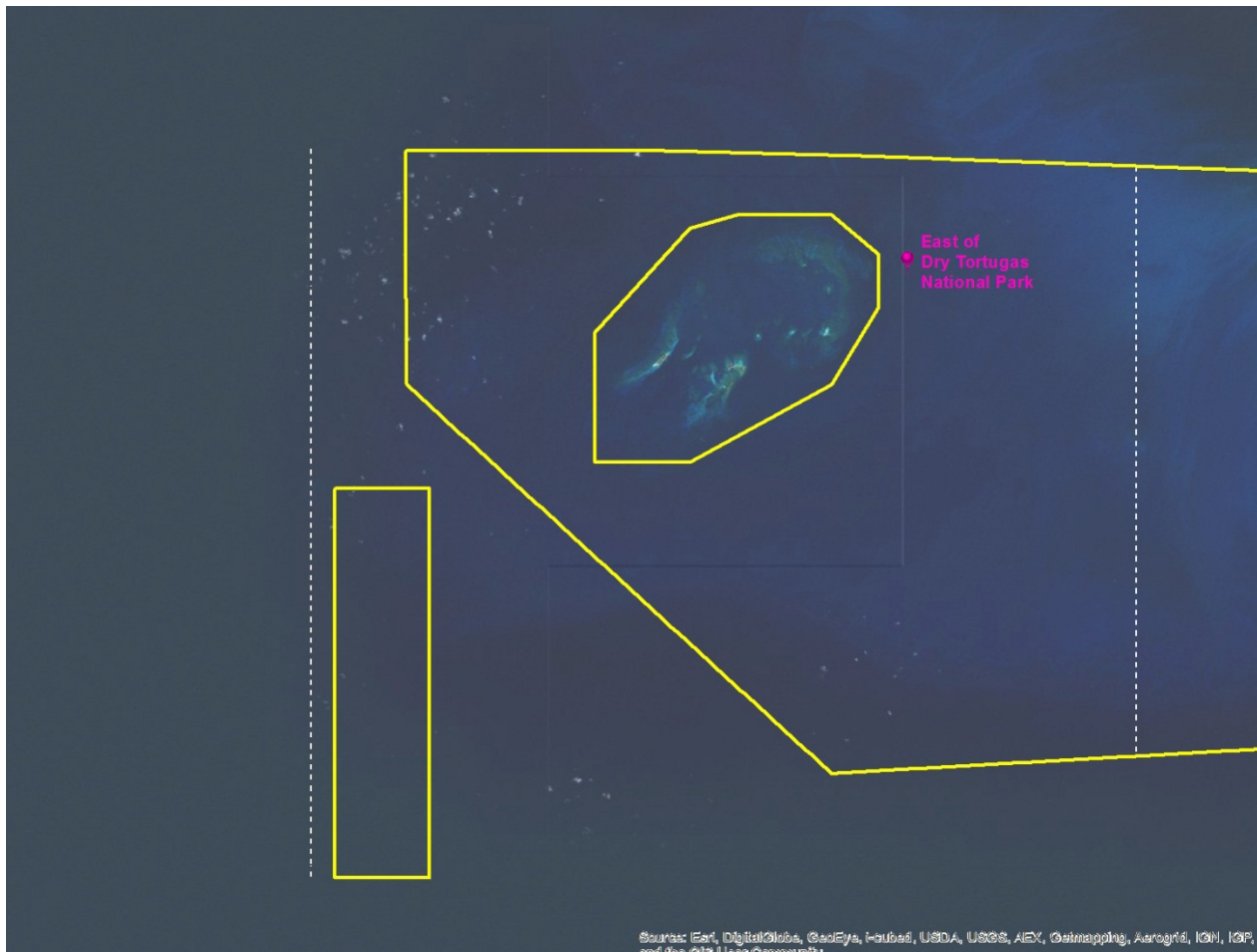
**Other Recommended Areas**

- 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



## The Dry Tortugas



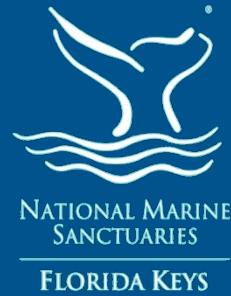
**Tier 1 Areas**



**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



# Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

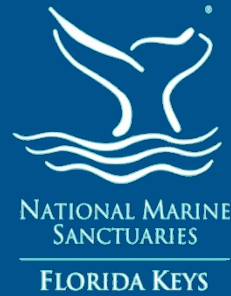


Management and access options could include

- 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



# Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems

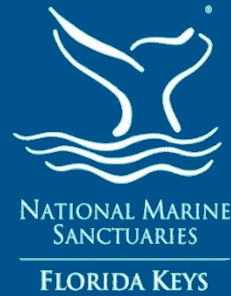


Develop incentive (sponsored) sites –

- 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

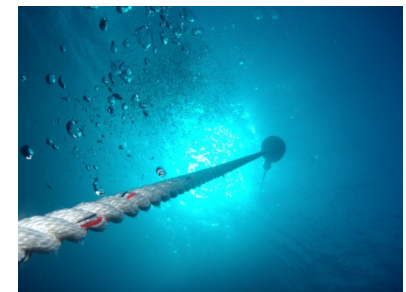


# Objective 1: Identify Specific Areas and Zones for Active Restoration of Coral Reef Ecosystems



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





NATIONAL MARINE  
SANCTUARIES  
FLORIDA KEYS

A silver fish, likely a species of surgeonfish, is shown swimming in shallow, clear water. The fish has a prominent black spot on its side and a yellow patch near its eye. It is positioned over a sandy bottom with some green seagrass. The water is bright blue, and the background shows a rocky or coral reef structure.

-

# Objective 3: Identify Adaptive Management Measures and Criteria for Opening Areas Closed for Restoration Purposes



## 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



## 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

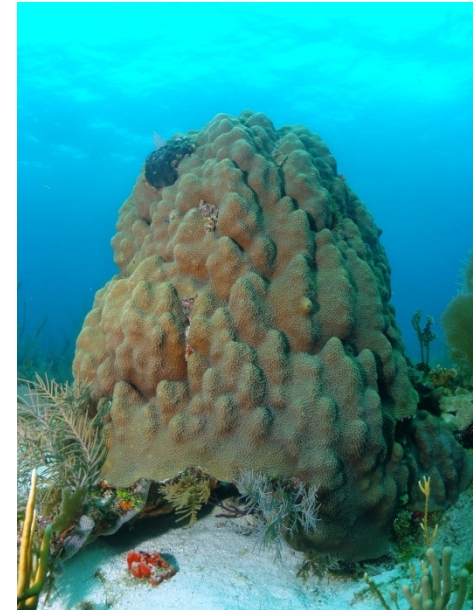


# Objective 3: Identify Adaptive Management Measures and Criteria for Opening Areas Closed for Restoration Purposes

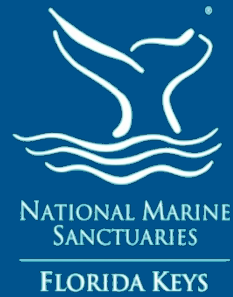


Possible adaptive management responses to triggers:

- 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



# Working Group Resources



Florida Keys National Marine Sanctuary Marine Zoning and Regulatory Review: [floridakeys.noaa.gov](http://floridakeys.noaa.gov)

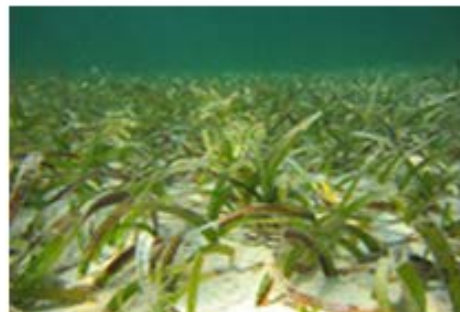


Marine Zoning & Regulatory Review

Maps, Data, and GIS Resources:  
[http://ocean.floridamarine.org/fknms\\_zone\\_review](http://ocean.floridamarine.org/fknms_zone_review)



**Coral Reef Ecosystem Restoration Working Group**  
Coral health in the sanctuary has declined over the past several



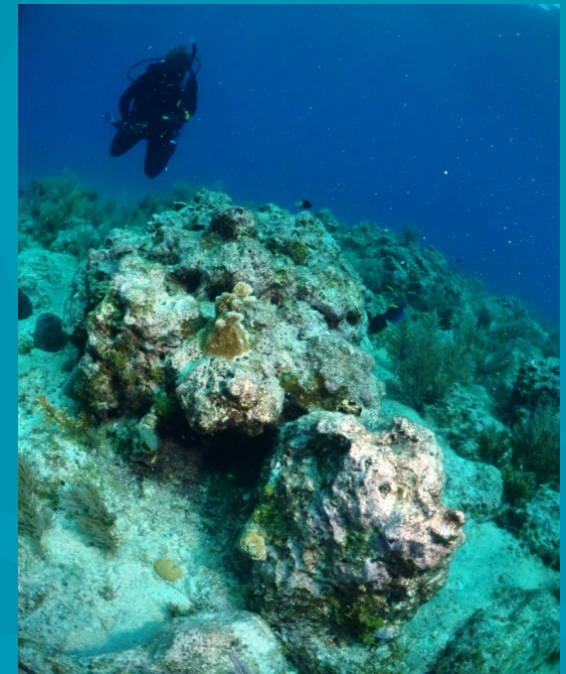
**Shallow Water Wildlife and Habitat Protection Working Group**  
Hardbottom communities and



**Ecosystem Protection: Ecological Reserves, Preservation Areas and Wildlife Protection Working Group**



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



Ken Nedimyer  
Sanctuary Advisory Council Lead  
Working Group Chair