Southeast Florida Coral Reef Initiative: A Local Action Strategy

Prepared by
Florida Department of Environmental Protection
Office of Coastal and Aquatic Managed Areas
Coral Reef Conservation Program

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Southeast Florida Coral Reef Initiative
Acting above to protect what's below.

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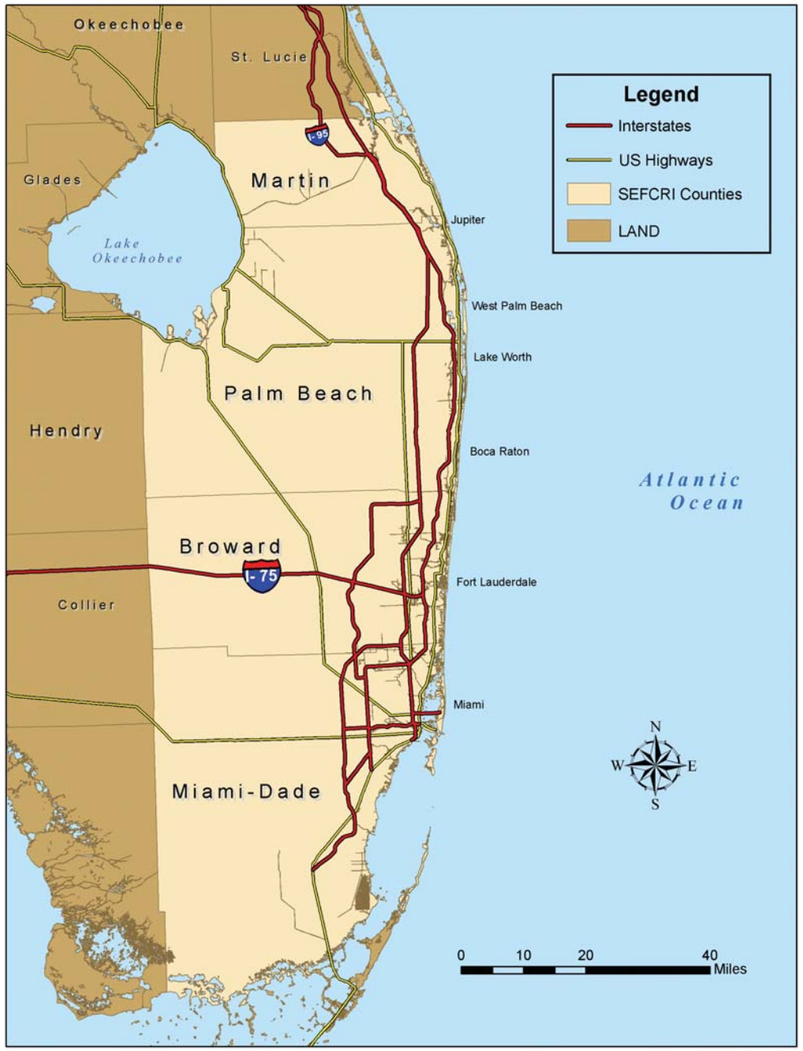

Figure 1. The Southeast Florida Coral Reef Initiative spans the coral communities, coastal waters and lands of Miami-Dade, Broward, Palm Beach and Martin Counties.

INTRODUCTION

In 1998, the United States Coral Reef Task Force was established by Presidential Executive Order #13089 to lead U.S. efforts to preserve and protect coral reef ecosystems. The U.S. Coral Reef Task Force is comprised of representatives from twelve federal agencies responsible for various aspects of coral reef conservation, seven states, commonwealths and territories and three freely associated states (Micronesia, Marshall Islands, and Palau). The seven states, commonwealths and territories include American Samoa, the Commonwealth of the Northern Marianna Islands, Guam, Hawaii, Puerto Rico, the U.S. Virgin Islands, and Florida.

During the eighth meeting of the U.S. Coral Reef Task Force, held in Puerto Rico in 2002, the Task Force adopted the Puerto Rico Resolution, which called for the development of Local Action Strategies (LAS) by each of the seven member U.S. states, territories and commonwealths. These LAS are three-year, locally-driven roadmaps for collaborative and cooperative action among federal, state, territory and non-governmental partners which identify and implement priority actions needed to reduce key threats to coral reef resources.

The goals and objectives of the LAS are closely linked to those found in the U.S. National Action Plan to Conserve Coral Reefs, adopted by the U.S. Coral Reef Task Force in 2000. From the thirteen goals identified in the National Action Plan, the Task Force prioritized six threat areas as the focus for immediate local action: over-fishing, land-based sources of pollution, recreational overuse and misuse, lack of public awareness, climate change and coral bleaching, and disease. Additional focus areas were identified in some jurisdictions including: invasive species in Hawaii, population pressure in American Samoa, and maritime industry and coastal construction impacts in Florida. American Samoa, the Commonwealth of the Northern Marianna Islands, Guam, Hawaii, Puerto Rico, U.S. Virgin Islands, and Florida created specific Local Action Strategies for select locally relevant threats, using the six priority focus areas as a guide. Applying a collaborative decision-making process based on local needs, concerns and capacities, each jurisdiction developed strategies that contain a variety of projects designed for implementation over a three-year period (Fiscal Year 2005-2007).

SOUTHEAST FLORIDA CORAL REEF INITIATIVE: Florida's Local Action Strategy

The state of Florida contains a substantial portion of the United States' coral reef ecosystems. Florida is committed to the tenets of U.S. Executive Order 13089, which call for preservation and protection of the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment.

With guidance from the U.S. Coral Reef Task Force, the Florida Department of Environmental Protection (FDEP) and the Florida Fish and Wildlife Conservation Commission (FWC) coordinated the formation of a team of interagency marine resource professionals (state, regional, local, and federal), scientists and other stakeholders. This team, now known as the Southeast Florida Coral Reef Initiative Team (SEFCRI Team), first gathered to develop local action strategies in May 2003 targeting coral reefs and associated reef resources from Miami-Dade County, through Broward and Palm Beach Counties, to Martin County (Figure 1). This region was chosen because the coral ecosystems are close to shore and co-exist with intensely urbanized areas that lack a coordinated management plan (like that of the Florida Keys National Marine Sanctuary).

Southeast Florida Coral Reef Initiative Team

The Southeast Florida Coral Reef Initiative Team is responsible for guiding the overall direction of the Southeast Florida Coral Reef Initiative (SEFCRI) program. The SEFCRI Team includes both agency and non-agency participants and strives to include both technical experts and resource users.

The SEFCRI Team is comprised of four focus teams, each responsible for one of the four SEFCRI focus areas (Land-Based Sources of Pollution, Maritime Industry and Coastal Construction Impacts, Fishing, Diving and Other Uses, Awareness and Appreciation). Each focus team is responsible for the development and implementation of their component of the SEFCRI. This includes defining and revising goals, objectives and actions, priority setting, budget development, building implementation teams and tracking progress.

Each focus team is led by navigators. Navigators are knowledgeable in their field and have good communication and process skills. Navigators representing agencies are responsible for representing the SEFCRI in their agencies and working to promote cross-linkages, program integration and support for LAS implementation. Non-agency navigators are responsible for representing local community stakeholder views. Navigators are the primary points of contact for the focus team and hold the overall responsibility for keeping the focus team moving ahead.

In 2004, the Florida Department of Environmental Protection, hosting agency for the SEFCRI, hired a program manager to support and manage the overall LAS effort.

Southeast Florida Coral Reef Initiative Development Process

Numerous stakeholders participated in the development of Florida's Local Action Strategy, the Southeast Florida Coral Reef Initiative. From May 2003 through November 2004, the SEFCRI evolved into the current LAS using a facilitated process including public review and input.

During the development process, the SEFCRI Team met regularly to identify threats of greatest imminent concern to the reefs of the southeast Florida region and to draft projects that address these threats. Consecutive drafts of the LAS were presented for review to local stakeholders over the course of four public meetings. Comments and suggestions from public meeting attendees were then used to further develop and refine the LAS and produce this document. Public input from individuals unable to attend the final meeting was solicited, collected by email and surface mail and, where feasible, incorporated into this document.

The Southeast Florida Coral Reef Initiative addresses four focus areas of concern:

- Awareness and Appreciation
- Land-Based Sources of Pollution
- Fishing, Diving, and Other Uses
- Maritime Industry and Coastal Construction Impacts

The Initiative is organized into issue statements, goals, objectives, and projects[1] for each of these four threat areas.

[1] *Due to the funding cycle, which became available prior to completion of this LAS, year one project numbers appear out of order. Priority projects for year one are indicated by a †.*

To select priority actions for funding, the SEFCRI Team developed the following criteria:

1. The action fits within the goals and objectives agreed upon in the LAS document.
2. There is a high probability that the focus team responsible for the action's implementation can successfully manage the activity through to a successful conclusion.
3. The action demonstrates commitment by the SEFCRI program to address critical management issues that are important to the stakeholders.
4. The SEFCRI program has or can secure the resources to complete the project. Resources include people, funding and in-kind support.
5. The action will do nothing to harm the environment.

The Southeast Florida Coral Reef Initiative is intended to be a flexible, living document that evolves in response to the state of the coral reef ecosystem and the progress of implemented projects. Although the projects included in this LAS would ideally be completed within a three-year period, it is recognized that project implementation and success is dependent on securing appropriate levels of support.

Southeast Florida Coral Reef Initiative Vision Statement

To develop an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing balance between resource use and protection, in cooperation with all interested parties.

ACKNOWLEDGEMENTS

The Southeast Florida Coral Reef Initiative was developed through the collaborative effort of many government agency, non-government organization, university and private partners representing:

- Biscayne National Park
- Broward County Audubon Society
- Broward County Environmental Protection Department
- Broward County Extension Education/University of Florida IFAS
- CCI Consulting Engineers Inc.
- Coastal Planning and Engineering Inc.
- Coastal Systems International
- College of Charleston
- Cry of the Water
- Environmental Defense
- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Florida Keys National Marine Sanctuary
- Florida International University
- Florida Outdoor Writers Association
- Florida Sea Grant
- Florida Sportsman Magazine
- Greater Fort Lauderdale Diving Association
- Harbor Branch Oceanographic Institute
- International Game Fish Association
- Lighthouse Point Saltwater Sportsman Association
- Marine Industries Association of Florida
- Martin County
- Miami-Dade County Environmental Resources Management
- McMaster University
- National Coral Reef Institute at Nova Southeastern University
- National Oceanic & Atmospheric Administration
- Ocean Engineering
- Ocean Watch Foundation
- Palm Beach County Department of Environmental Resources Management
- PADI Project Aware
- Port Everglades
- Port of Miami
- Port of Palm Beach
- Smithsonian Institute Marine Station
- South Florida Diving Headquarters
- South Florida Water Management District
- Tetra Tech
- The Nature Conservancy
- The Ocean Conservancy
- Tropical Audubon Society
- University of Georgia
- University of Miami
- University of North Carolina, Wilmington
- University of South Florida
- U.S. Army Corps of Engineers
- U.S. Coast Guard/Marine Safety Office
- U.S. Department of Agriculture/Natural Resources Conservation Service
- U.S. Environmental Protection Agency
- U.S. Geological Survey
- Vone Research

Photos provided courtesy of David Gilliam, National Coral Reef Institute.
Map provided courtesy of the Florida Fish and Wildlife Conservation Commission.

AWARENESS AND APPRECIATION ACTION PLAN

Issue 1: Needs Assessment
Issue 2: Citizen and Visitor Awareness and Appreciation

ISSUE 1: Needs Assessment

Inventorying the existing coral reef outreach and education programs and products, assessing targeted audiences in the southeast Florida region and utilizing the information gained, will improve coordination and targeted coral reef ecosystem outreach and education efforts in southeast Florida.

GOAL: Increase the effectiveness and decrease duplication of coral reef education and outreach efforts in southeast Florida.

[Objective 1]
Conduct an inventory to compile existing coral reef outreach and education programs, products and points of contact being utilized in southeast Florida.

Project 9†: Inventory the existing programs, products and points of contact related to coral reef education and outreach and determine where gaps and overlaps exist.

[Objective 2]
Develop and conduct a needs assessment utilizing a representative sample of Miami-Dade, Broward, Palm Beach and Martin counties' residents, visitors and specific groups that use the coral reef (e.g. fishers, divers, boaters, surfers) to identify effective messages and tools based on: (1) existing citizen knowledge, values, and practices related to coral reef ecology and conservation and, (2) citizens preferred method of receiving information.

Project 8†: Conduct a needs assessment of the general public, stakeholders and visitors and analyze the data.

ISSUE 2: Citizen and Visitor Awareness and Appreciation

Lack of awareness and appreciation of the southeast Florida coral reef ecosystem (Figure 2) is a contributing cause to its continued degradation. Increasing awareness and appreciation of the importance of the southeast Florida coral reef ecosystem to citizens and visitors of Miami-Dade, Broward, Palm Beach, and Martin counties will encourage positive behaviors and decisions that benefit coral reefs.

GOAL: Increase awareness and appreciation of the coral reef ecosystem to the residents and visitors of southeast Florida.

[Objective 1]
Develop a marketing campaign about the southeast Florida coral reef ecosystem and the SEFCRI. The developed campaign will reach 50% of the media outlets (radio, TV, newspaper) in the 4-county area.

Project 1†: Develop a marketable identity (logo and slogan) for the SEFCRI.
Project 2†: Create and distribute a media packet containing information on the southeast Florida coral reef ecosystem and the SEFCRI.
Project 10: Develop and distribute a campaign of public service announcements (radio and video) about the southeast Florida coral reef ecosystem and the SEFCRI.
Project 11: Develop and distribute a series of news articles on the southeast Florida coral reef ecosystem and the SEFCRI.
Project 12: Offer media excursions about the southeast Florida coral reef ecosystem and the SEFCRI.

Figure 2. The southeast Florida coral reef ecosystem is the northern extension of the Florida reef tract. It is generally comprised of three reefs running parallel to shore and separated by sand flats. The reefs are colonized by a variety of organisms including stony corals, octocorals, sponges and algae, which provide habitat, food and shelter for many species of fishes, invertebrates, sea turtles and marine mammals.

[Objective 2]
Develop a campaign targeting decision-makers and elected officials about the southeast Florida coral reef ecosystem and the SEFCRI.

Project 7†: Offer excursions for decision-makers and elected officials to educate them about the southeast Florida coral reef ecosystem and the SEFCRI.
Project 13: Create and distribute a briefing packet containing information on the southeast Florida coral reef ecosystem and the SEFCRI.
Project 14: Members of the SEFCRI Team conduct one-on-one briefings with elected officials.
Project 15: Identify and contact organizations and agencies conducting coral reef out reach and education to incorporate coral reef conservation messages and information on the SEFCRI.

[Objective 3]
Develop a campaign targeting tourists about the southeast Florida coral reef ecosystem and the SEFCRI based on the results of the needs assessment in Issue 1.

Project 3†: Develop an informative tent card for coastal hotel/motel guestrooms.
Project 16: Develop an informative door hanger for hotel/motel guest rooms.
Project 17: Develop a public service video announcement for in-house hotel TV systems.
Project 18: Produce an in-flight public service video announcement about the southeast Florida coral reef ecosystem to target commercial flights to Miami-Dade, Broward, Palm Beach and Martin counties.

[Objective 4]
Develop materials on the southeast Florida coral reef ecosystem and the SEFCRI for distribution to the general public using the existing environmental education network (e.g. environmental centers, hotels/motels, outreach efforts, etc.).

Project 4†: Develop a traveling portable exhibit that can be displayed in libraries, government centers, businesses, SEFCRI Team member locations, conferences/tradeshows/festivals, etc.
Project 5†: Design an interactive and informational website for the southeast Florida coral reef ecosystem and the SEFCRI.
Project 19: Develop a general brochure about the southeast Florida coral reef ecosystem and the SEFCRI. Reprint/update brochure in year 2 and 3.
Project 20: Develop and present a speaking package and educational materials with various "versions" for different audiences – general public, homeowners, divers, fishers, boaters, surfers, students/youth, etc. about the southeast Florida coral reef ecosystem and how people can protect it.

[Objective 5]
Develop a campaign targeting the dive industry in the 4-county area about the southeast Florida coral reef ecosystem and the SEFCRI based on the results of the needs assessment in Issue 1.

Project 6†: Hold three PADI Project Aware "Coral Reefs in Sustainable Tourism – Protecting Your Business by Protecting the Coral Reef" seminars for dive operators in Miami-Dade, Broward, Palm Beach and Martin counties.
Project 21: Increase the distribution of the PADI Project AWARE coral reef video and CD in southeast Florida.

Project 22: Work with the various coastal cleanups (e.g. The Ocean Conservancy, PADI, Project AWARE and other local efforts) to incorporate information about southeast Florida's coral reefs and the SEFCRI.
Project 23: Create a "presence" (e.g., display, brochure distribution, etc.) about the southeast Florida coral reef ecosystem and the SEFCRI at appropriate and relevant community events, festivals, conferences and tournaments in southeast Florida.

[Objective 6]
Develop a campaign targeting the recreational boating industry in the 4-county area about the southeast Florida coral reef ecosystem and the SEFCRI based on the results of the needs assessment in Issue 1.

Project 24: Work with the Marine Industries Association of South Florida (MIASF) to incorporate an educational component in the annual MIASF Waterway cleanup.
Project 25: Incorporate information on the southeast Florida coral reef ecosystem and the SEFCRI into the Clean Marina Program.
Project 26: Utilize existing organizations (e.g. United States Coast Guard Auxiliary, U.S. Power Squadron, and FWC Auxiliary) to handout information about the southeast Florida coral reef ecosystem, the SEFCRI and proper boating-related protocol (e.g. boating safety, speed zones, fishing regulations and diving techniques).
Project 27: Develop a brochure on sewage pump-out and its benefits to natural resources.

[Objective 7]
Develop a campaign targeting the fishing industry in the 4-county area about the southeast Florida coral reef ecosystem and the SEFCRI based on the results of the needs assessment in Issue 1.

Project 28: Work with agencies and clubs (e.g. FWC, IGFA and local fishing clubs) that conduct fishing clinics in southeast Florida to incorporate information about the southeast Florida coral reef ecosystem and the SEFCRI.
Project 29: Work with the FWC to include articles about the southeast coral reef ecosystem and the SEFCRI in the publication, Fishing Lines.
Project 30: Expand the Sea Grant "Ethical Angling" education program.
Project 32: Develop and post informational coral reef related signage at fishing piers, boat ramps and marinas.
Project 33: Distribute appropriate and available coral reef related materials (e.g. SEFCRI and CORAL guidelines) to marine related businesses.
Project 34: Support the expansion of the statewide Monofilament Recovery and Recycling Program in southeast Florida.

[Objective 8]
Develop a campaign targeting youth in the 4-county area about the southeast Florida coral reef ecosystem and the SEFCRI.

Project 35: Develop Coral Reef Conservation Education Kits.
Project 36: Train high school students and organize youth groups to give presentations about the southeast Florida coral reef ecosystem to other schools and youth groups.
Project 37: Conduct teacher workshops on the southeast coral reef ecosystem and SEFCRI.
Project 38: Hire a full-time employee to coordinate and deliver SEFCRI outreach products and activities.

FISHING, DIVING AND OTHER USES ACTION PLAN

Issue 1. Different Conservation Ethics
Issue 2. Direct Extractive Impacts
Issue 3. Indirect (unintended) Impacts on Habitat
Issue 4. Artificial Reefs
Issue 5. Reliable Funding Sources

ISSUE 1: Different Conservation Ethics

Varying consumer conservation ethics and ignorance or disregard of Florida's fishing laws result in lack of compliance with fisheries regulations. These factors, coupled with increased user pressure, push marine law enforcement officers beyond their capabilities to enforce seasonal closures, size limits and other regulations on protected marine life.

GOAL: Increase compliance with Florida fishing regulations regarding seasonal closures, size limits, catch limits, gear restrictions and protected marine life.

[Objective 1]
Develop a strategy to optimize law enforcement effectiveness in the SEFCRI geographic region.

Project 2: Develop simple and quick processes for citizens to report violations to local law enforcement. Have report stations at boat ramps and beach parks. Post 1-800 numbers in conspicuous places, and make them available on laminated wallet cards and bumper stickers.

Project 3: Increase enforcement of regulations by stationing officers at major inlets to perform random checks of reef users.

Project 5: Coordinate the various law enforcement agencies with adjacent or overlapping jurisdictions.

[Objective 2]
Conduct a threat assessment of violations to determine the best law enforcement focus.

Project 6: Survey user groups to identify areas of repeat violations that they have observed.

Project 7: Provide results of survey information on environmental violations to local law enforcement so they can concentrate their efforts on problem areas.

[Objective 3]
Establish a non-law enforcement presence on the water for awareness and voluntary compliance of regulations.

Project 8: Coordinate volunteer reef patrol utilizing local Coast Guard Auxiliary, U.S. Power Squadron and other voluntary groups to interact with user groups.

Project 9: Coordinate with mooring buoy monitoring groups to report potential problems.

[Objective 4]
Coordinate goals, objectives and actions with existing management organizations to maximize resources.

Project 1[1]: Collaborate with federal, state and local environmental management organizations such as FWC, FDEP and city and county agencies to review existing management programs and materials and to avoid duplication of efforts. Evaluate current Florida and U.S. regulations and existing scientific literature regarding their effectiveness.

ISSUE 2: Direct Extractive Impacts

Removal of living marine resources by recreational and commercial activities impacts the quality and quantity of marine populations and communities, and can threaten the long-term ecological persistence of reefs as we know them (Figure 3). Excessive use compromises the integrity, stability and beauty of the marine ecosystems by removal of organisms that result in degradation of the coral reef ecosystem. The consequences include: unsustainable fisheries with diminished yields of fishes and shellfishes; loss of opportunities for research and education; user conflicts; reduced recreational enjoyment; and diminished economic and social benefits through degraded ecosystem function.

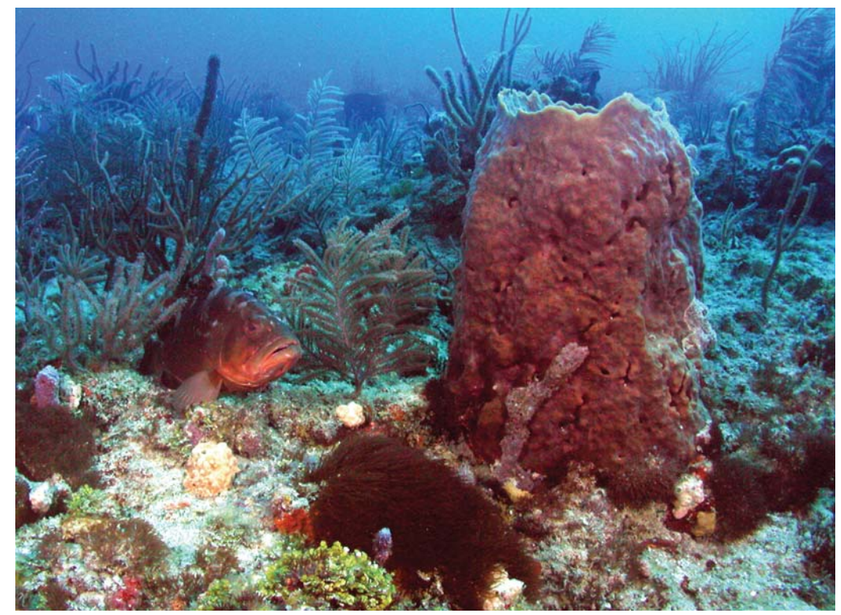

Figure 3. Large fishes, such as this grouper, once abundant on southeast Florida reefs, are rarely seen today.

GOAL: Balance all fishing and recreational activities within sustainable limits of the reef ecosystem to minimize user conflicts, provide equitable uses, protect the coral reef ecosystem and ensure optimal benefits to present and future generations.

[Objective 1]
Compile existing information on reef condition and user activities for the SEFCRI geographic region.

Project 10: Identify, assemble, and assess existing historical maps and fishery-independent and fishery dependent data on reef biodiversity (fish, coral, invertebrate, etc., composition, abundance, condition and size structure) from study area. Collect information and data on the other impacts of fishing and diving, including the cascading ecological effects, impacts and relationships of keystone species, prey/predator relationships, impacts to trophic food webs, etc. and link this information with Awareness & Appreciation group to develop educational material and workshops. Evaluate existing literature regarding effectiveness of special management zones from around the world for applicability to the SEFCRI geographic region.

Project 11: Determine the relative importance of reef versus offshore fishing in terms of participation and extraction levels from existing data.

[Objective 2]

Assess the current condition and threats to reef resources from fishing and recreational extractive activities.

Project 12: Identify the types, quantity, and trends of commercial and recreational extractive use by county. Conduct user survey to map and quantify where different recreational and commercial reef activities take place, their intensity and identify conflicts among users.

Project 15[2]**:** Conduct a social and economic evaluation of reef related fishing and recreational activities.

[Objective 3]

Determine the carrying capacity of the reef ecosystem to support different fishing, diving, collecting and other activities using defined scientific criteria.

Project 17: Review and evaluate published relationships between reef stress and reef performance parameters as functions of fishing and recreational activities.

Project 18: Conduct fishery assessments using overfishing and overfished criteria.

Project 19: Compare relative contributions of fishing and diving to other anthropogenic sources of stress to the reef ecosystem.

Project 20: Identify strategies and tools to balance and optimize sustainable use and conservation of reef resources. Present recommendations to county governments, FWC, FDEP, and the South Atlantic Fisheries Management Council (SAFMC) for an effective, balanced and comprehensive management strategy for fishing, diving and other uses that will achieve resource protection goals.

Project 21: Create artificial reefs protected from fishing and compare them to similar fished artificial reefs.

[Objective 4]

Evaluate the potential of a scientifically-based marine zoning plan.

Project 23: Identify criteria useful for zoning reef resources as special, sensitive and representative areas needing enhanced management through local input in order to develop zoning alternatives by county.

[Objective 5]

Evaluate the potential of traditional fishery management measures.

[2] *Projects 13 and 14 were incorporated into Projects 12 and 26.*

Project 24: Develop resource targets that balance use and protection in coordination with the FWC and the SAFMC under the Magnuson-Stevens Fishery Conservation and Management Act and other relevant federal and state legislation.

Project 25: Develop draft of traditional fishery management (non-zoning) alternatives to achieve targets developed in Project 24.

[Objective 6]

Develop and effective, balanced, and comprehensive management strategy for improved resource protection.

Project 26: Organize and hold public workshops to obtain input on the condition and usage trends, possible resource goals, and the potential (i.e. rationale, effectiveness, alter native approaches, etc.) of traditional fishery management and special management zones to achieve targets. Independently verify (spot check) accuracy of user provided information from project 12.

Project 27: Work with FWC and FDEP to develop regional targets and alternative strategies to achieve targets.

ISSUE 3: Indirect (unintended) Impacts on Habitat

Fishing, diving, boating, and other activities by recreational and commercial users can have indirect (unintended) impacts on reef habitat from anchoring, physical contact, and improper disposal of sewage, fuel, oil, liquids, garbage and solid waste.

GOAL: Minimize indirect impacts on the reef ecosystem and its living marine resources from recreational and commercial use. Reduce improper waste disposal by recreational users by 50% (measured by beach and reef cleanup data).

[Objective 1]

Reduce improper solid waste disposal.

Project 29: Establish well organized beach cleanup data collection point for all counties.

Project 30: Develop volunteer reef clean-up day with multi-county data collection.

Project 31: Identify funding and supply ample trash and recyclable material disposal containers at all public access areas.

Project 32: Develop strategies to reduce the trash being generated.

[Objective 2]

Reduce anchor damage by developing a mooring buoy system for the SEFCRI geographic region.

Project 33: Determine areas of the reef most impacted by recreational anchoring using aerial surveys or questionnaires (related to project 12).

Project 34: Provide sufficient permanent mooring buoys in determined areas. Project should provide for proper placement, inventory and maintenance of buoys.

Project 35: Determine which special events result in anchoring on the reef and supply temporary mooring line as an alternative to anchorage.

[Objective 3]

Reduce sewage from commercial and recreational boating activities by establishing free boat sewage pump-out stations.

Project 36: Gain support of public water access location and marinas to install marine pump-out stations.

Project 37: Research available grants or other sources of funding to install pump out stations in pre-approved sites.

[Objective 4]
Increase the understanding and practice by recreational divers of non-destructive diving practices.

Project 38: Meet with commercial dive boat operators to obtain their ideas and to explain and gain support for giving standardized reef protection instructions to their customers.
Project 39: Develop a diving guidelines brochure for hand-out at dive shops, dive magazine articles, diver training programs, informational kiosks and volunteer water patrols.
Project 40: Develop a diver's code of conservation ethics with dive industry.

[Objective 5]
Identify, assess and reduce other indirect boating impacts (e.g. reduce sea turtle strikes during offshore boat races conducted in the nesting season).

Project 41: List the concerns of potential indirect impacts on reefs from stakeholders.
Project 42: Develop possible measures to reduce boating impacts.

ISSUE 4: Artificial Reefs

Improper use of materials, placement and deployment of artificial reefs can damage reef habitat, further deplete stressed fish populations and cause user conflicts.

GOAL: Ensure reef ecosystems are not harmed or degraded by artificial reefs through proper planning, development and deployment of artificial reefs and development and implementation of long-term management and monitoring programs.

[Objective 1]
Evaluate the effectiveness and impact of artificial reefs and determine if and when the optimum, or maximum, number and coverage of artificial reefs has been reached for the SEFCRI geographic region.

Project 43: Compile existing data and focus research on the effects of artificial reefs on nearby natural reefs. Do they attract marine life from natural reefs or provide beneficial habitat for new recruits?
Project 44: Identify other management issues requiring scientific research.
Project 45: Conduct user survey to determine stakeholder perceptions of artificial reefs including artificial reef effectiveness and impacts on natural reefs, current and projected frequencies and types of use, and types of artificial reefs.
Project 46: Compile and review available information pertaining to artificial reefs, such as their effectiveness in achieving their purpose, types of acceptable materials, reef type selectivity for specific fish age classes, etc., to provide a basis for the new guidelines.

[Objective 2]
Develop monitoring programs for existing and new artificial reefs in the SEFCRI geographic region.

Project 47: Use standardized criteria and methods for monitoring artificial reef biotic assemblages.
Project 48: Develop statistically valid sampling programs to measure the effectiveness of artificial reefs for attaining their planned purpose(s).

Project 49: Conduct periodic assessments of data to evaluate existing artificial programs and to assess future needs.

ISSUE 5: Reliable Funding Sources

Provide funding necessary to support costs of enforcement, education, monitoring, potential anchor buoys, marine zoning and fishery management programs. Enhancement of enforcement, education, anchor buoys, and marine zoning requires a reliable funding source. Current funding sources are not adequate.

GOAL: Provide a reliable funding source to support the activities of the SEFCRI.

[Objective 1]
Provide sufficient revenue.

Project 50: Work with the FWC, FDEP, and federal and local governments to provide sufficient resources to support the SEFCRI strategies.

LAND BASED SOURCES OF POLLUTION AND WATER QUALITY ACTION PLAN

Issue 1: Determining the Extent and Condition of the Resource
Issue 2: Determining the Sources and Extent of Pollution
Issue 3: Determining the Link between the Resource and Pollution
Issue 4: Designing and Implementing Activities to Reduce Land-Based Sources of Pollution Affecting the Coral Reef Ecosystem
Issue 5: Lack of Public Awareness

ISSUE 1: Determining the Extent and Condition of the Resource

Coral reefs and their associated habitats are important biological and economic resources for southeast Florida. However, there is a lack of qualitative and quantitative information concerning the extent, nature and overall condition of this fragile and very important component of the ecosystem. Existing information on the overall condition of coral reef resources and the factors which influence and control their distribution and health have not been adequately analyzed and compiled and more data are needed.

GOAL: Characterize the existing condition of the coral reef ecosystem.

[Objectives 1 and 4]

Assemble and assess existing data on the condition of the southeast Florida coral reef resources and establish a long-term coral condition monitoring program for the counties in the SEFCRI geographic region.

[Objective 2]

Assemble existing water quality data and establish a long-term status and trends water quality monitoring program for the coastal and offshore waters of Miami-Dade, Broward, Palm Beach, and Martin Counties.

[Objective 3]

Determine which environmental factors will be used to assess the condition of the coral reefs.

[Objective 5]

Assess the data and identify data gaps.

Project 4*: Establish a Technical Advisory Committee (TAC) to collect, review and assess data and identify data gaps, conduct technical workshops, and advise the SEFCRI Team and the Land-Based Sources of Pollution and Water Quality (LBSP) focus team.
The TAC will be composed of scientists with expertise in coral reef ecology, coral biology, coral pathology, coral physiology, water quality, mapping/remote sensing, etc. Compile existing data on the status of the natural environment in the geographic area of interest (coastal waters of Miami-Dade, Broward, Palm Beach, and Martin Counties) and develop cause-effect relationships. Assess the existing data and make recommendations as to what additional information is necessary/required and prioritize data gaps.
Project 12*: Expand the Florida Keys Coral Reef Evaluation & Monitoring Project (CREMP) to Southeast Florida (SECREMP) (Figure 4).
Project 11: Establish an integrated data management program with the Fish and Wildlife Research Institute (FWRI).
Project 25: Establish a long-term coastal water quality monitoring program in the SEFCRI geographic region.
Project 26: Develop a volunteer monitoring program related to LBSP and reef communities.

Figure 4: The unique, nearshore staghorn coral (Acropora cervicornis) stands of Broward County are surveyed as part of the Southeast Florida Coral Reef Evaluation and Monitoring Program.

[Objective 6]

Using existing high resolution Laser Airborne Depth Sounder (LADS) bathymetric mapping data, acquire and overlay habitat information to map the benthic habitats of Broward County.

Project 6*: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Broward County.

[Objective 7]

Using existing high resolution LADS bathymetric mapping data, acquire and overlay benthic habitat information to map the benthic habitats of Palm Beach County.

Project 7: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Palm Beach County.

[Objective 8]
Using existing high resolution LADS bathymetric mapping data, acquire and overlay habitat information to map the benthic habitats of Miami-Dade County.

Project 8: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Miami-Dade County.

[Objective 9]
Acquire high resolution bathymetry and habitat data to map the benthic habitats of Martin County.

Project 9: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Martin County.

[Objective 10]
Map the nearshore benthic habitats of the SEFCRI geographic region.

Project 10: Acquire high-resolution, multi-spectral imagery to map the benthic habitats within the 0-6 meter depths along the entire SEFCRI geographic region.

ISSUE 2: Determining the Sources and Extent of Pollution
Significant pollution loads to coastal waters, from both point and non-point sources, may be impacting the coral reefs. The sources need to be identified and the relative and absolute contributions of each source need to be defined and quantified.

GOAL: Quantify, characterize, and prioritize the land-based sources of pollution that need to be addressed based on identified impacts to the coral reef ecosystem.

[Objective 1]
Assemble existing data to quantify and characterize the sources of pollution and identify the relative contributions of point and non-point sources.

Project 1†: Assemble existing data to quantify and characterize the sources of pollution and identify the relative contributions of point and non-point sources.
Project 13: Conduct a technical workshop on the outcomes of Project 1, and prepare a written summary of the workshop (to be held in conjunction with Project 15).

[Objective 2]
Develop a mass balance budget for the geographic region of interest to address nutrients, carbon, and other pollutants of concern.

Project 14: Create a Working Group which will meet every 6 months to: quantify amounts of pollution; identify the sources of pollution; determine residence time of pollutants in specific geographic areas; determine the frequencies of major pollution events; and develop a gross nutrient budget. Hire a post doctoral candidate to derive the mass balance equation and prepare a report identifying the primary point and non-point sources of pollution. The post doctoral candidate will also serve as the LBSP Project Coordinator, working closely with the TAC and LBSP team to secure funding and do the implement this and other LBSP projects.

Project 27: Quantify amount and flow rate (flux) of pollution transported by groundwater to the coastal waters.
Project 28: Determine flux of pollutants exiting offshore wastewater outfall pipes and net flux to reef communities.
Project 29: Determine flux of pollutants exiting ocean inlets and net flux to reef communities.
Project 30: Determine flux of pollutants from oceanic sources to coastal waters.
Project 31: Determine flux of pollutants from atmospheric sources to coastal waters.

ISSUE 3: Determining the Link between the Resource and Pollution
While there is insufficient information to definitively link degradation of coral reef habitat with land-based sources of pollution, there are ample data to indicate that nutrients and other pollutants are negatively impacting the corals and other biological resources in southeast Florida. Biological indicators of land based pollutants, such as the proliferation of nuisance species of algae, need to be identified for the coral reefs and associated habitats of southeast Florida, and cause/effect relationships involving land-based sources of pollution, transport pathways, and biological communities need to be further investigated and better understood.

GOAL: Identify how land-based sources of pollution affect southeast Florida coral reef ecosystems.

[Objective 1]
Identify the links between pollution and coral reef resources.

Project 2†: Review state and local water quality standards applicable to coral reef communities and conduct a literature search to identify the links between pollution and the health/condition of coral reef communities.
Project 5†: Conduct a bio-marker study to identify and trace specific contaminants that negatively impact coral reefs.
Project 15: Conduct a technical workshop on the outcomes of Project 2 and 5, and prepare a written summary of the workshop (to be held in conjunction with Project 13).
Project 17: Conduct Stakeholder meeting(s) to present new LBSP information.
Project 32: Identify sources and signals of land-based pollutants in southeast Florida using stable isotopes as a sewage signal in octocorals and macroalgae/Lyngbya tissue.
Project 33: Identify sources and signals of land-based pollutants in southeast Florida using human enteroviruses as an indicator of fecal contamination.

[Objective 2]
Determine priority areas that need to be surveyed for additional biological and water quality pollutant indicators.

Project 18: Conduct technical workshop(s) to determine priority areas that need to be surveyed for additional biological and water quality pollutant indicators.

ISSUE 4: Designing and Implementing Activities to Reduce Land-Based Sources of Pollution Affecting the Coral Reef Ecosystem

Actions are needed to reduce water pollution directly by using Best Management Practices (BMPs), prohibiting or restricting certain activities, modifying existing regulations, and/or focusing enforcement. Other actions may be designed to make the regulatory/management system work more efficiently, leading indirectly to reduced pollution.

GOAL: Reduce the impacts of land-based sources of pollution to the coral reef ecosystem.

[Objective 1]

Compile a comprehensive list of agencies and other entities and all ongoing/planned programs, projects, and activities that address land-based pollutants (sediments, nutrients, pesticides, ground water, etc.) entering the coastal waters of southeast Florida. Identify gaps, problems, and resource needs associated with ongoing projects and activities.

Project 3†: Contact appropriate agencies/entities and request information: compile a list of agencies/entities and programs/projects/activities and; generate an associated report that addresses gaps, problems, and resource needs associated with ongoing projects and activities. This effort will include: reviewing Surface Water Improvement and Management (SWIM) plans in geographic areas of interest; reviewing Total Maximum Daily Loads (TMDL) in geographic areas of interest; reviewing the Indian River Lagoon Comprehensive Conservation and Management Plan; reviewing the Comprehensive Everglades Restoration Program (CERP) plans as they relate to the southeast Florida coast; compiling existing data; conducting technical workshop(s) to review and assess the compiled data; identifying gaps in information/data; and conducting special studies/research to fill information/data gaps.

[Objective 2]

Design activities to reduce pollution from the highest priority sources of pollution.

Project 19: Research/identify existing BMPs that appropriately and effectively address the identified high priority sources of pollution.

Project 20: Develop specific projects (engineering/management actions) for designated hot spots.

Project 21: Conduct a technical workshop to evaluate the outcomes of Project 19 and implement Project 20.

[Objective 3]

Initiate the implementation of engineering/management actions to reduce pollution from the highest priority sources.

Project 22: Identify the responsible agency/agencies and secure funding.

Project 23: Implement priority engineering/management actions.

ISSUE 5: Lack of Public Awareness

Lack of public awareness and understanding contribute to the negative effects of land-based sources of pollution on water quality and coral reefs.

GOAL: Increase public awareness and understanding of the effects of land-based sources of pollution on water quality and coral reefs.

[Objective 1]

Work in close coordination and cooperation with the Awareness and Appreciation focus team.

Project 24: Educate and inform stakeholders, including the general public, about the value and importance of the coral reef ecosystem of southeast Florida, land-based sources of pollution, pollution impacts on the resource, and the strategies recommended to address the problems.

MARITIME INDUSTRY AND COASTAL CONSTRUCTION IMPACTS ACTION PLAN

Issue 1: Projects and Activities that Threaten Coral Systems
Issue 2: Cumulative Habitat Loss Due to Physical Impacts Associated with Coastal Construction Activities
Issue 3: Mitigation and Restoration
Issue 4: Ensuring Compliance with Regulatory Conditions

ISSUE 1: Projects and Activities that Threaten Coral Systems

Coral systems in southeast Florida are threatened by projects and activities such as anchoring, vessel groundings (Figure 5), infrastructure installation (e.g. cables, pipelines and outfalls), beach renourishment, and dredge and fill operations in and around the reefs of southeast Florida.

Figure 5. Large ships cross the reefs of southeast Florida to access ports-of-call and adjacent anchorages.

GOAL: Protect coral systems from impacts associated with projects and activities in and around the reef tracts of southeast Florida.

[Objective 1]

Review, revise, implement and enforce existing regulations which protect coral reefs, inclusive of funding issues and resources. Increase effectiveness of permit conditions to protect coral communities, and increase efficiency of regulatory review.

Project 1†: Identify and evaluate local, state and federal rules for relevance, effectiveness, and level of compliance and enforcement. Compile all regulations at all levels of government (local, state and federal) and develop a comprehensive "regulatory check-list" including the sufficiency of the existing distribution and allocation of fines received from impact events. Recommend revisions to regulations, as appropriate, to streamline the regulatory process for all agencies. Identify how to begin the rule changing process (what and why). Evaluate establishment/utilization of environmental bonds for coastal construction projects.

Project 4: Initiate rule making to fill identified gaps and streamline the regulatory process for all agencies. Utilizing recommendations from Project 1, collate and integrate recommendations regarding legislation and regulation revisions. Work with agencies to initiate the recommendations and seek to provide support for drafting of rules that implement the recommendations of Project 1 that will enhance and benefit coral reef protection.

Project 5: Educate project developers on the implementation of regulations.

[Objective 2]

Avoid and minimize impacts on coral reef ecoystems from dredge and fill activities and infrastructure (pipelines, outfalls, cables) installation on coral reef ecosystems. Reduce the aerial extent of project-related impacts.

Project 3†: Identify innovative technologies, construction practices and procedures that minimize or eliminate coral reef impacts. Review and recommend criteria for coral reef mitigation (associated with construction activities or groundings).

- Identify existing practices, including physical and process-based activities that contribute to impacts on coral systems.
- Review the extent and components of regional beach erosion control programs for purpose, method and effectiveness.
- Review advanced technologies and/or methodologies associated with beach front erosion reduction and shoreline stabilization that minimize or eliminate impacts on coral systems.
- Identify opportunities for incorporation and/or implementation of advanced/innovative technologies in local beach maintenance programs.
- Identify/recommend criteria, components and values for appropriate and/or acceptable mitigation activities for coral reef impacts.
- Evaluate the applicability of existing impact indicators for use in permit conditions (turbidity, buffers, sedimentation).
- Review the effectiveness of regulatory conditions to minimize impacts to coral reefs.
- Recommend modifications in, or new regulations to minimize coral reef impacts.
- Evaluate the potential for standard conditions for coral reef protection.

Project 6: Development of BMPs for construction, dredge and fill and other activities around coral reefs by compiling management practices for the marine industry and evaluating the effectiveness of existing goals and objectives.

Project 7: Recommend/pursue the development of a Programmatic Environmental Impact Statement (PEIS) for beach dredge and fill projects in southeast Florida.

[Objective 3]

Eliminate ship anchoring, grounding and other impacts to southeast Florida coral reefs and hard bottoms. Identify anchorages containing reef area for modification, and increase in utilization of detailed management practices.

Project 8: Modify the footprint of existing anchorages to avoid hard bottoms. Mark NOAA charts with appropriate anchorages; use LADS and other data to map potential new anchorage locations and potential no anchor zones. Begin the establishment process for new anchorages that minimize the potential for reef impacts.

Project 9: Identify management options to prevent anchoring, grounding, and accidental impacts to coral reefs and hard bottoms (buffer zones, buoy marker systems, improved nautical charts and enforcement). Improve enforcement of current anchorages. Evaluate use and constraints of mooring buoys to reduce anchoring impacts on coral resources. Implement the recommendations of Project 2. Evaluate the feasibility of vessel restriction/vessel use areas. Establish specific waste collection vessels for large ships in anchorages.

ISSUE 2: Cumulative Habitat Loss Due to Physical Impacts Associated with Coastal Construction Activities

Cumulative habitat losses due to physical impacts associated with coastal construction activities, such as dredging activities, building seawalls, docks, seagrasses and mangrove destruction adversely affect reef systems in southeast Florida.

GOAL: Change coastal development and construction practices in ways that protect marine and estuarine habitats.

[Objective 1]

Facilitate information transfer to improve protection of coral resources. Demonstrate avoidance and minimization of impacts to coral resources at the project planning stage.

Project 10: Hold public coastal construction information workshops. Evaluate exchange between industry and local, state, and federal agencies on all projects including small-scale coastal construction. Summarize and evaluate technologies for shoreline protection and erosion control.

Project 11: Create an electronic database that can be used in the inter-agency permit review process.

- Develop an internet map server accessible to all agencies, developers and stakeholders.
- Develop the concept of an interagency large construction review board and publish board activities.
- Publish outcomes of interagency meetings via press releases on the effects of the project.
- Provide information sheets and simple graphics to make project review more transparent and provide better review.
- Identify and describe the process of interagency coordination that affects coral resources.
- Identify and communicate necessary and sufficient information to support regulatory and management decisions.
- Develop a model of successful interagency interactions to characterize and apply those processes that are working well.
- Describe the process of successful interagency coordination and activities affecting coral resources.

Project 12: Work with the Awareness and Appreciation focus team to develop an information pamphlet to describe shoreline protection and erosion control measures that protect marine habitats.

Project 13: Review and enhance methods, process and response to citizen reporting of potential non-compliance and resource impacts. Evaluate an omsbudsman approach.

ISSUE 3: Mitigation and Restoration

Maritime and construction activities in the coastal zone can have anticipated and inadvertent impacts resulting in the destruction of coral communities. Appropriate mitigation and restoration is needed to address these impacts.

GOAL: Develop and implement marine and estuarine habitat restoration.

[Objective 1]

Coordinate among agencies for procedures and methods to decrease the time between coral reef injuries and initiation of reef organism salvage.

Project 2*: Develop guidelines for rapid response to, and restoration of, coral reef injuries in southeast Florida.

[Objective 2]

Support research and publication of peer-reviewed scientific literature on issues related to coral reef damage, recovery, and restoration.

Project 14: Initiate research into a suitable substrate material and adhesives that are stable through high-energy events and have biodegradability similar to reef pavement. Identify research funding sources. Submit relevant proposals on the research topic. Alternatively, if funding source is in hand, develop and promulgate a Request for Proposals (RFP) on the topic and select appropriate responders for funding. Conduct proposed research and submit results to appropriate conferences and journals.

Project 15: Initiate research into the sequence of biotic recovery on impacted areas, identifying early recruiters, successional recruiters and their precursors, and identifying organisms that block or hinder healthy recruitment. Identify research funding sources. Submit relevant proposals on the research topic. Alternatively, if funding source is in hand, develop and promulgate a RFP on the topic and select appropriate responders for funding. Conduct proposed research and submit results to appropriate conferences and journals.

Project 16: Research the long-term effects of exotic materials (e.g. iron, cement, rubber, fiberglass, etc.) on recruitment efficiency, biodiversity and community structure. Identify research funding sources. Submit relevant proposals on the research topic. Alternatively, if funding source is in hand, develop and promulgate a RFP on the topic and select appropriate responders for funding. Conduct proposed research and submit results to appropriate conferences and journals.

Project 17: Develop a non-proprietary website publishing research results in a layman format available to developers, planners and scientists. Identify website hosting availability and a webmaster to assist. Require research results from Projects 14, 15 and 16 to be submitted in an easily understandable layman format. Provide materials to the webmaster and maintain and update the website.

[Objective 3]

Evaluate and promote stable, durable, and environmentally appropriate artificial reef construction. Artificial reef construction that does not adversely affect natural marine habitats.

Project 18: Coordinate with local, state and federal agencies managing and building artificial reefs in southeast Florida to ensure coral resource protection is addressed in regional (and state-wide) artificial reef usage and placement efforts (e.g. for mitigation and habitat/fisheries enhancement).

- Require environmentally appropriate artificial reef development that minimizes risk to important natural habitats and structure (e.g. benthic stability, biological community structure, geological structures and natural hydrodynamics).
- Develop criteria for the appropriate distance artificial reefs should be constructed relative to natural habitats to avoid impacts to natural habitats and systems.
- Develop artificial reef placement criteria that maximize stability during intense storm events.
- Evaluate substrates, materials, siting, spacing and regional scale of artificial reef development to maximize benefits of artificial construction while minimizing negative impacts from this development.
- Evaluate anchoring systems that provide high holding power, are environmentally friendly and aesthetically pleasing. Describe methods to increase stability of artificial reef materials.
- Define standards to evaluate the long-term stability of artificial reefs (i.e. 25-year, 50-year, and 100-year recurrence storm events).

Project 19: Develop BMPs for artificial reef siting, construction and anchoring in southeast Florida. Assemble a working team of experts to draft these BMPs.

ISSUE 4: Ensuring Compliance with Regulatory Conditions

There is a disparity between the emphasis and allocation of resources and the ability of enforcement to ensure compliance with regulatory conditions. This disparity contributes to impacts on reef communities, a lack of identification of impacts resulting from non-compliance, and a lack of corrective activities/actions.

GOAL: Ensure compliance with regulatory requirements (including special conditions) by increasing compliance review and enforcement actions.

[Objective 1]

Modify agency policies and focus related to compliance and enforcement efforts to reduce non-compliance with marine habitat protection regulatory requirements, and increase resources dedicated toward compliance and enforcement related activities.

Project 20: Evaluate the effectiveness of existing compliance and enforcement activities to protect coral and hard bottom communities.

Project 21: Develop recommendations for modifications in compliance and enforcement protocols based on the outcomes of Project 1 and Project 19, inclusive of a needs analysis for implementation of recommendations.

Project 22: Identify funding and implementation opportunities for needs identified in Project 2.

Project 23: Ensure compliance with special conditions by increasing enforcement review and actions. Modify the emphasis of compliance and enforcement efforts based on the outcome of element one of this project. Focus compliance and enforcement efforts to reduce non-compliance of marine habitat protection. Conduct education and outreach to enforcement agencies regarding coral protection.

[Objective 2]

Increase the awareness of industry representatives and the public on the benefits (monetary and environmental) of compliance with regulations. Develop and deliver a workshop program about the purpose and benefits of regulatory compliance.

Project 24: Conduct education and outreach to enforcement agencies regarding coral protection.

[Objective 3]

Develop recommendations for funding sources for enforcement and compliance actions and activities.

Project 25: Evaluate/initiate programs such as 'adopt-a-buoy'/marker/reef area, to promote greater awareness, participation and funding for necessary reef protection activities and areas of concern.

Project 26: Create a template for preparing cumulative impact sections of project reviews and assessments. Compile and apply existing data from impacts, causative actions, mitigation, and efficacy mitigation.

Project 27: Improve project and mitigation monitoring. Review past monitoring programs for sufficiency and rigor. Provide guidance for project (mitigation, dredge & fill, and infrastructure related construction) monitoring programs which will include appropriateness of program design, areal and temporal sufficiency and statistical rigor of the monitoring program.

Southeast Florida Coral Reef Initiative

Acting above to protect what's below.

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