



**Florida Keys National Marine Sanctuary Advisory Council
Marine Zoning and Regulatory Review**

**Sanctuary Advisory Council Regulatory and Zoning Alternatives
Development Work-Plan**

Actions for Review and Recommendation

**For Florida Keys National Marine Sanctuary Advisory Council
Consideration: October 21, 2014**

**Florida Keys National Marine Sanctuary
Marine Zoning and Regulatory Review**

**Florida Keys National Wildlife Refuges Complex
Backcountry Management Plan Update**

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Introduction and Background

The Florida Keys National Marine Sanctuary Advisory Council (advisory council), working with public and community experts, is leading the process to help guide and develop recommendations for changes to the Florida Keys National Marine Sanctuary (FKNMS) regulations and marine zoning plan. Based on the direction from the FKNMS management plan (2007), the advisory council's guidance in adopted goals and objectives (see below), and public comments, nine specific priority issues were identified to be addressed by the advisory council as part of this process:

1. Shallow Water Wildlife and Habitat Protection
2. Coral Reef Ecosystem Restoration
3. Ecosystem Protection: Ecological Reserves / Preservation Areas and Wildlife Protection
4. Permit Procedures and Adaptive Management
5. Artificial Habitats
6. Study Areas and Boundary Modifications
7. Personal Watercraft Tours/ Fishing Conflicts
8. Water Quality
9. Fishery Management Coordination

For three work-plan items, the advisory council created working groups to focus on addressing those identified priorities: (1) Coral Reef Ecosystem Restoration, (2) Shallow Water Wildlife and Habitat Protection, and (3) Ecosystem Protection: Ecological Reserves/Preservation Areas and Wildlife Protection. Working groups allow the advisory council to gather information from community experts, user groups, and scientists. The advisory council's three working groups completed several months of meetings since their work began in January 2013. Working group draft recommendations were developed using relevant scientific and resource information, as well as input from the public, during meetings that were held throughout the Florida Keys. The advisory council has reviewed each of the working groups' suite of recommendations and has made recommendations to the Sanctuary Superintendent for those items to conduct further analysis in a Draft Environmental Impact Statement (see Appendix I for the advisory council motions related to these three work-plan items).

For the remaining six work-plan items, the advisory council requested that FKNMS staff and other relevant partners conduct the necessary analysis. This document includes that analysis and associated recommendations and is intended to help the advisory council identify those issues that should be included in the economic and environmental analysis. While two of these work-plan items have already been reviewed and recommendations made by the Council ((6) Study Areas and Boundary Modifications; (7) Personal Watercraft Tours / Fishing Conflicts), all analysis and recommendations/decisions are included.

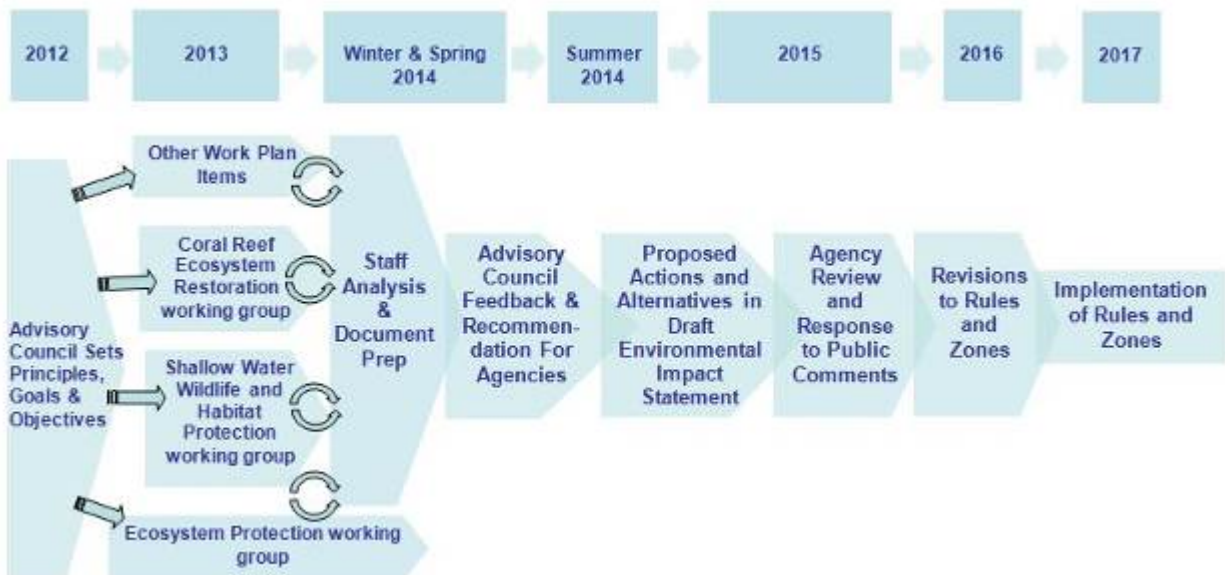
This document includes three main sections:

- 1) Summary of draft recommendations for advisory council review and consideration.
- 2) Analysis of work-plan items and associated draft recommendations.
- 3) Review and background on previous actions taken by the advisory council during their 2013-2014 agenda. These include:

- Study Areas and Boundary Modifications – reviewed and action taken at December 11, 2012 advisory council meeting;
 - Personal Water Craft Tours / Fishing Conflicts – reviewed and action taken at December 11, 2012 advisory council meeting;
 - Law Enforcement – reviewed at February 18, 2014 advisory council meeting with action taken at April 15, 2014 advisory council meeting;
 - Education and Outreach – reviewed at April 16, 2013 advisory council meeting;
 - Vessel / Boating Licensing and Education – reviewed at August 20, 2013 advisory council meeting; and
 - Alternative Funding Mechanisms / User Fees – discussed and action taken at July 9, 2013 advisory council meeting.
- 4) Appendices providing (1) Advisory council motions on marine zoning and regulatory review issues; and (2) additional information related to Water Quality, Law Enforcement, Education and Outreach, and the 1997 Protocol for Cooperative Fisheries Management.

This document includes 15 draft recommendations for advisory council review and highlights 6 recommendations previously made by the advisory council. From the 15 draft recommendations, the advisory council will identify those recommendations for which further analysis is needed prior to making a final recommendation to the sanctuary superintendent for potential changes to the FKNMS marine zones and regulations. Further analysis will be done through a Draft Environmental Impact Statement. The full list of recommendations can be found starting on page 13.

The review of the marine zone boundaries and regulations of FKNMS is a very involved, open, and public process culminating in the implementation of any regulatory modifications, additions, or eliminations in 2017. The process will take time – not months, but years. It will involve proactively reaching out to members of the community to gather input, weighing collected information against the best available science, and developing recommendations that will allow the sanctuary to meet the goals and objectives of the review. From there the advisory council will develop recommendations for NOAA and the U.S. Fish and Wildlife Service to consider, and staff will assess the environmental and economic impacts of any modifications or additions to sanctuary regulations. Finally, any changes to marine zone regulations or boundaries will be adopted and implemented.



Florida Keys National Marine Sanctuary Condition Summary Table

Status:



- Trends: ▲ Conditions appear to be improving.
 — Conditions do not appear to be changing.
 ▼ Conditions appear to be declining.
 ? Undetermined trend.
 N/A Question not applicable.

The following table summarizes the “State of Sanctuary Resources”. The first two columns list 17 questions used to rate the condition and trends for qualities of water, habitat, living resources, and maritime archaeological resources. The Rating column consists of a color, indicating resource condition, and a symbol, indicating trend (see key for definitions). The Basis for Judgment column provides a short statement or list of criteria used to justify the rating. The Description of Findings column presents the statement that best characterizes resource status, and corresponds to the assigned color rating. The Description of Findings statements are customized for all possible ratings for each question. The Response column describes current or proposed management responses to pressures impacting sanctuary resources.

#	Questions/Resources	Rating	Basis for Judgment	Description of Findings	Sanctuary Response
WATER					
1	Are specific or multiple stressors, including changing oceanographic and atmospheric conditions, affecting water quality and how are they changing?	▼	Large-scale changes in flushing dynamics over many decades have altered many aspects of water quality; nearshore problems related to runoff and other watershed stressors; localized problems related to infrastructure.	Selected conditions may inhibit the development of assemblages and may cause measurable but not severe declines in living resources and habitats.	In conjunction with the Environmental Protection Agency and Florida Department of Environmental Protection, the sanctuary will continue implementation of its Water Quality Protection Program and conduct long-term water quality monitoring and research to understand the effects of water transported from near-field and far-field sources, including Florida Bay on water quality in the sanctuary. New regulations prohibit discharge or deposit of sewage from marine sanitation devices (MSD) within the boundaries of the sanctuary and require MSDs be locked to prevent sewage discharge or deposit while inside sanctuary boundaries. The marine area surrounding the Florida Keys has been designated as a Particularly Sensitive Sea Area by the International Maritime Organization. Florida Department of Health Florida Healthy Beaches Program tests for the presence of fecal coliform and enterococci bacteria in beach water on a weekly basis, at 17 locations throughout the Keys. The MEERA Project, which is designed to provide early
2	What is the eutrophic condition of sanctuary waters and how is it changing?	—	Long-term increase in inputs from land; large, persistent phytoplankton bloom events, many of which originate outside the sanctuary but enter and injure sanctuary resources.	Selected conditions have caused or are likely to cause severe declines in some but not all living resources and habitats.	
3	Do sanctuary waters pose risks to human health and how are they changing?	—	Rating is a general assessment of “all waters” of the sanctuary, knowing that in very specific locations, the rating could be as low as “poor.” Increased frequency of HABs and periodic swim advisories.	Selected conditions have resulted in isolated human impacts, but evidence does not justify widespread or persistent concern.	
4	What are the levels of human activities that may influence water quality and how are they	▲	Historically, destructive activities have been widespread throughout the Florida Keys, but	Selected activities have caused or are likely to cause severe impacts, and cases to date suggest a pervasive problem.	

	changing?		many recent management actions are intended to reduce threats to water quality.		detection and assessment of biological events occurring in the Florida Keys and surrounding waters, continues to be supported by the sanctuary. A well-established law enforcement program is in place, including NOAA Fisheries Service, Florida Fish and Wildlife Conservation Commission, and U.S. Coast Guard.
HABITAT					
5	What are the abundance and distribution of major habitat types and how are they changing?	—	In general, mangrove and benthic habitats are still present and their distribution is unchanged, with the exception of the mangrove community, which is about half of what it was historically. The addition of causeways has changed the distribution of nearshore benthic habitats in their vicinity.	Selected habitat loss or alteration has taken place, precluding full development of living resource assemblages, but it is unlikely to cause substantial or persistent degradation in living resources or water quality.	Marine zoning is used in the sanctuary to protect sensitive habitats like shallow coral reefs. Mooring buoys have been installed as a threat-reduction measure. Sanctuary staff and volunteers educate and inform boaters about the unique nature of the coral reef habitat, and organize shoreline clean-up and marine debris removal efforts. Sanctuary staff assess and restore vessel grounding injuries to seagrass and coral habitats, as well as perform coral rescue activities associated with coastal construction. Large vessel avoidance and Racon beacons in lighthouses have resulted in declines in large vessel groundings. An Area To Be Avoided was established to prevent ships larger than 50 meters in overall length from transiting through sensitive areas in the sanctuary. A well established permitting program is in place to issue a variety of permits for activities that are otherwise prohibited by sanctuary regulations. There is also a well-established law enforcement program in place, including NOAA Fisheries Service, the Florida Fish and Wildlife Conservation Commission, and the U.S. Coast Guard. State of Florida's Mangrove Trimming and Preservation Act of 1996 (§403.9321-403.9333) regulates how mangroves can be trimmed and altered, and by whom.
6	What is the condition of biologically structured habitats and how is it changing?	▼	Loss of shallow (<10 meters) <i>Acropora</i> and <i>Montastraea</i> corals has dramatically changed shallow habitats; regional declines in coral cover since the 1970s have led to changes in coral-algal abundance patterns in most habitats; destruction of seagrass by propeller scarring; vessel grounding impacts on benthic environment; alteration of hard-bottom habitat by illegal casitas.	Selected habitat loss or alteration has caused or is likely to cause severe declines in some but not all living resources or water quality.	
7	What are the contaminant concentrations in sanctuary habitats and how are they changing?	?	Few studies, but no synthesis of information.	N/A	
8	What are the levels of human activities that may influence habitat quality and how are they changing?	▼	Coastal development, highway construction, vessel groundings, over-fishing, shoreline hardening, marine debris	Selected activities have caused or are likely to cause severe impacts, and causes to date suggest a pervasive problem.	

			(including derelict fishing gear), treasure salvaging, increasing number of private boats, and consequences of long-term changes in land cover on nearshore habitats.		
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LIVING RESOURCES					
9	What is the status of biodiversity and how is it changing?	▼	Relative abundance across a spectrum of species has been substantially altered, with the most significant being large reef-building corals, large-bodied fish, sea turtles, and many invertebrates, including, the long-spined sea urchin. Recovery is questionable.	Selected biodiversity loss has caused or is likely to cause severe declines in some but not all ecosystem components and reduce ecosystem integrity.	Marine zoning assists in the protection of the biological diversity of the marine environment in the Keys. Mooring buoys have been installed in these zones to reduce anchor damage to coral reef biota. The sanctuary’s education and outreach team established the “Blue Star” program to help reduce the impact of divers and snorkelers on the coral reef ecosystem. NOAA has also established the Dolphin SMART program encouraging responsible viewing of wild dolphins. Sanctuary staff assesses and restores vessel grounding injuries to seagrass and coral habitats, as well as performs coral rescue activities associated with coastal construction. NOAA Fisheries Service (American Recovery and Reinvestment Act) awarded \$3.3 million to support <i>Acropora</i> coral recovery and restoration in Florida (including the Keys) and the U.S. Virgin Islands. Other coral nursery efforts are also underway that contribute to coral restoration. Private efforts examining potential of long-spined sea urchin recovery via nursery propagation and rearing are also underway. A well-established permitting program is in place to issue a variety of permits for activities that are otherwise prohibited by sanctuary regulations, including removal of the invasive lionfish from the small no-take zones. The Florida Keys “Bleach Watch” Program utilizes volunteers to provide reports from the reef on the actual condition of corals throughout the bleaching season. The sanctuary also participates in oil spill drills sponsored by the U.S. Coast Guard and is a partner in the Florida Reef Resilience Program. There is a well-established law enforcement program in place.
10	What is the status of environmentally sustainable fishing and how is it changing?	?	Historical effects of recreational and commercial fishing and collection of both targeted and non-targeted species; it is too early to determine ecosystem effects of new fishery regulations and new ecosystem approaches to fishery management.	Extraction has caused or is likely to cause severe declines in some but not all ecosystem components and reduce ecosystem integrity.	
11	What is the status of non-indigenous species and how is it changing?	▼	Several species are known to exist; lionfish have already invaded and will likely cause ecosystem level impacts; impacts of other non-indigenous species have not been studied.	Non-indigenous species may inhibit full community development and function, and may cause measurable but not severe degradation of ecosystem integrity.	
12	What is the status of key species and how is it changing?	—	Reduced abundance of selected key species including corals (many species), queen conch, long-spined sea urchin, groupers and sea turtles.	The reduced abundance of selected keystone species has caused or is likely to cause severe declines in ecosystem integrity; or selected key species are at severely reduced levels, and recovery is unlikely.	
13	What is the condition or health of key species and how is it changing?	▼	Hard coral and gorgonian diseases and bleaching frequency and severity have caused substantial declines over the last two decades; long-term changes in seagrass condition; disease in sea turtles; sponge die-offs; low reproduction in queen conch; cyanobacterial blooms; lost fishing gear and other marine debris impacts on marine life.	The comparatively poor condition of selected key resources makes prospects for recovery uncertain.	

LIVING RESOURCES (continued)					
14	What are the levels of human activities that may influence living resource quality and how are they changing?	—	Despite the human population decrease and overall reduction in fishing in the Florida Keys since the 1990s, heavy recreational and commercial fishing pressure continues to suppress biodiversity. Vessel groundings occur regularly within the sanctuary. Annual mean number of reported petroleum and chemical spills were around 150 during that time period, with diesel fuel, motor oil, and gasoline representing 49% of these incidents collectively. Over the long term, localized direct impacts may be overwhelmed by the adverse and wide-ranging indirect effects of anthropogenic climate change resulting in sea level rise, abnormal air and water temperatures, and changing ocean chemistry.	Selected activities have caused or are likely to cause severe impacts, and cases to date suggest a pervasive problem.	
MARITIME ARCHAEOLOGICAL RESOURCES					
15	What is the integrity of known maritime archaeological resources and how is it changing?	▼	Resources are non-renewable and are subject to deterioration or loss resulting from looting, chemical processes, shifting sediments, marine life, fishing gear entanglement and vessel groundings (the last two are increasing in frequency).	The diminished condition of selected archaeological resources has substantially reduced their historical, scientific, or educational value and it likely to affect their eligibility for listing in the National Register of Historic Places.	Proactive management of submerged archaeological resources in sanctuary waters is occurring in conjunction with the state of Florida and the Advisory Council on Historic Preservation. This partnership is responsible for managing cultural resources in the sanctuary consistent with the Federal Archaeology Program, the Abandoned Shipwreck Act of 1987 and the National Historic Preservation Act. The sanctuary’s education team has also developed a historic Shipwreck Trail, which highlights nine historic vessels that sank in sanctuary waters and represents three broad periods of keys maritime history. Sanctuary regulations prohibit alteration of the seafloor, thus commercial salvage in the sanctuary must
16	Do known maritime archaeological resources pose an environmental hazard and is this threat changing?	—	Movement of sunken vessels during storm threatens nearby resources.	Selected maritime archaeological resources may pose isolated or limited environmental threats, but substantial or persistent impacts are not expected.	
17	What are the levels of human activities that may influence maritime archaeological resource quality and how are they	▼	Reports of looting and vessel grounding cases involving potential resources are increasing.	Selected activities have caused or are likely to cause severe impacts, and cases to date suggest a pervasive problem.	

	changing?				go through a review process before a permit for salvage is issued. A well-established law enforcement program is in place, including NOAA Fisheries Service, the Florida Fish and Wildlife Conservation Commission, and the U.S. Coast Guard.
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For More Information

The Florida Keys National Marine Sanctuary Condition Report can be found here: (<http://floridakeys.noaa.gov/scipublications/condition.html>).

Goals and Objectives for Marine Zoning and Regulatory Review

Approved on December 13, 2011 by Florida Keys National Marine Sanctuary Advisory Council.

The Sanctuary Advisory Council approved the following goals and objectives for the review of FKNMS zones and regulations in December 2011. These goals and objectives were highlighted in the public scoping notice in order to better inform public comments during the initial scoping period. These goals and objectives also provide guidance for the Sanctuary Advisory Council and working groups during development of recommendations for regulations, modifications to the zoning plan and other resource protection strategies.

- A. To improve the diversity of natural biological communities in the Florida Keys to protect, and, where appropriate restore and enhance natural habitats, populations and ecological processes overall and in each of these sub regions Tortugas, Marquesas, Lower, Middle, and Upper Keys.
 1. Reduce stresses from human activities by establishing areas that restrict access to sensitive wildlife populations and habitats.
 2. Protect large, contiguous, diverse and interconnected habitats that provide natural spawning, nursery, and permanent residence areas for the replenishment and genetic protection of marine life and protect and preserve all habitats and species.
 3. Improve/maintain the condition of the biologically structured habitats including
 - a. Coral Reef
 - i. Inshore Patch Reef
 - ii. Mid-Channel Patch Reef
 - iii. Offshore Patch Reef
 - iv. Reef Margin/Fore Reef
 - v. Deep Reef
 - b. Seagrass Bed
 - c. Hardbottom
 - d. Coastal Mangrove
 4. Increase abundance and condition of selected key species including corals, queen conch, long spined sea urchin, apex predatory fish, birds and sea turtles.
- B. To facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities.
 1. Minimize conflicts among uses compatible with the National Marine Sanctuary.
 2. Prevent heavy concentrations of uses that degrade Sanctuary resources.
 3. Provide undisturbed monitoring sites for research and control sites to help determine the effects of human activities.
 4. Achieve a vibrant ecologically sustainable ecosystem and economy.
 - a. Apply the best available science and balanced, conservation based management.

Principles for Marine Zoning and Regulatory Review

Approved on December 13, 2011 by Florida Keys National Marine Sanctuary Advisory Council.

1. The Florida Keys National Marine Sanctuary regulation/zoning review should be conducted with the recognition that there are bordering and overlapping marine management regimes in place, and that these regimes must be considered when contemplating changes to the Florida Keys National Marine Sanctuary regulation/marine zoning structure.
2. All areas of the Florida Keys National Marine Sanctuary should be classified as part of a specific zone, therefore the current “unzoned” area should be classified as a recognized zone type such as “general use area” or “multiple use area”.
3. Each habitat type should be represented in a non-extractive marine zone in each of the biogeographically distinct sub regions of the Florida Keys National Marine Sanctuary to achieve replication. The subregions identified were the Tortugas, Marquesas, and Lower, Middle, and Upper Keys.
4. Information on resilient reef areas that can serve as refugia should be taken into account in zoning changes.
5. Temporal zoning should be considered as a tool for protecting spawning aggregations and nesting seasons.
6. The size of individual non-extractive zoned areas, the cumulative total area included in non-extractive zones, and their spatial relationship with one another matter greatly in achieving the resource protection purposes of the Florida Keys National Marine Sanctuary.

Summary of Draft Recommendations for Council Review and Consideration

More detail for each of the following priority issues is included in each respective section. The below tables serve as overview summaries only.

Permit Procedures

Recommendation PP 1-5: Evaluate the following for economic and environmental benefit/impact.

ID	Evaluate for economic and environmental benefit/impact
PP-1	Create a new discharge exemption to allow dispersal of cremated human remains.
PP-2	Implement a prohibition on deserting or abandoning vessels and leaving harmful matter in vessels.
PP-3	Implement a prohibition on abandoning fishing gear.
PP-4	Clarify the discharge prohibition to address fish feeding by divers, vessels for hire, and in general except during fishing.
PP-5	Implement a prohibition on large boats using mooring buoys not specifically marked "large vessel."

Recommendation PP 6-7: Consider the following administrative changes and identify and evaluate any potential economic and environmental benefit/impact.

ID	Consider administrative updates and evaluate for economic and environmental benefit/impact
PP-6	Update definitions and terminology to be consistent with state laws and Office of National Marine Sanctuary regulations. Categories include: boating restricted areas, anchoring impacts, existing management areas, submerged lands, nearshore construction definitions, littering, divers down, and protected wildlife.
PP-7	Modify requirements for Tortugas North Ecological Reserves Access Permits to allow requests for permits more than thirty days prior to any given trip and allow the permit to be valid for longer than two weeks. (At present access permits must be requested at least 72 hours but no longer than one month before the date the permit is desired to be effective and the permit is effective for a maximum of 2 weeks.)

Adaptive Management

Recommendation AM 1-3: Identify and evaluate options for implementing an adaptive management framework in FKNMS.

ID	Identify and evaluate options for adaptive management
AM-1	Evaluate how an adaptive management framework could be designed and implemented to complement sanctuary regulations and strengthen the ability to more rapidly and flexibly respond to threats impacting sanctuary resources.
AM-2	Consider the following issues (as identified by the advisory council at the February and August 2013 advisory council meetings) as triggers / criteria to drive adaptive management:

	<ul style="list-style-type: none"> • Restoration zones (i.e. zone management, identifying new zones, moving zones) • Exotic / invasive species • Species specific impacts following an event (i.e. hurricane or cold water event) • Climate Change Impacts <ul style="list-style-type: none"> ○ Sea level rise ○ Warming that triggers coral bleaching and/or disease • New or intensified marine uses
AM-3	Update the emergency regulations to allow a temporary regulation to be in effect for up to six months, with one six month extension. (At present the emergency rule duration is 60 days with up to one 60 day extension.)

Artificial Habitats

Recommendation AH 1-2: Identify key research needs and funding mechanisms to assess environmental and economic benefit /impacts of artificial habitats/reefs in a national marine sanctuary.

ID	Evaluate economic and environmental benefit/impact
AH-1	Create a sub-committee to serve as a liaison between the Sanctuary Advisory Council and the research community to identify targeted research needs and funding mechanisms to appropriately assess the benefits and impacts of artificial reefs.
AH-2	Evaluate alternatives including establishing control site(s) on existing artificial reefs to facilitate research on the four investigations identified in the 2007 Management Plan.

Water Quality

Recommendation WQ 1: Evaluate the economic and environmental benefit/impact of addressing discharge of gray-water in FKNMS

ID	Evaluate the economic and environmental benefit/impact
WQ-1	Implement regulation of gray-water discharges from cruise ships similar to other National Marine Sanctuaries.

Fishery Management Coordination

Recommendation FMC 1-2: Contribute to and support Fishery Management Coordination

ID	Update Coordination Agreement & Engage with Fishery Management Bodies
FMC-1	As appropriate, provide recommendations to the fishery management bodies to increase coordination, consistency, and local input regarding fisheries in the Florida Keys.
FMC-2	Update the 1997 Protocol for Cooperative Fisheries Management as needed to implement changes in FKNMS fishing regulations.

Previous Advisory Council Action

Study Area & Boundary Modification – December 11, 2012

The advisory council reviewed and discussed the proposed Study Areas at the December 11, 2012 council meeting. The advisory council passed a motion to include the following areas in the review process and in the economic and environmental impact analysis:

1. Consider the existing Study Areas as proposed (see Figure 2.1-1)
2. Add additional areas including (see Figure 2.1-2):
 - a. make a straight line to connect Study Area 2 and 3 (see Study Area 2a), and
 - b. make straight lines to connect Study Area 4 and 6 (see Study Area 6a)

(for the motion see Appendix I)

Personal Watercraft Tours / Fishing Conflicts – December 11, 2012

The advisory council reviewed and discussed the PWC Co-op and LKGA proposal at the December 11, 2012 council meeting. The advisory council passed a motion to:

1. Include the agreement between the Lower Keys Guides Association and the Key West area PWC Co-op as part of the environmental and socioeconomic analysis in the Draft Environmental Impact Statement.

(for the motion see Appendix I)

The advisory council also requested that the 2007 Management Plan recommendations related to PWC be reviewed and evaluated (Florida Keys National Marine Sanctuary Advisory Council Regulatory and Zoning Alternatives Development Work-Plan, 2012).

Law Enforcement – April 15, 2014

The advisory council reviewed and discussed the issue of law enforcement within the sanctuary at the February 18, 2014 advisory council meeting. The advisory council unanimously passed a motion at the April 15, 2014 meeting (for the motion, see Appendix I).

Education and Outreach – April 16, 2013

The advisory council reviewed and discussed general sanctuary education and outreach activities at the April 16, 2013 advisory council meeting. At that time no formal recommendations were made, however the advisory council identified the following need:

- Additional education and outreach materials if new zones are created through this review process and the means and possibility of measuring the effectiveness of education programs and materials.

Vessel / Boater Licensing and Education – August 20, 2013

The advisory council reviewed and discussed boater education programs in Monroe County and the state of Florida at the August 20, 2013 advisory council meeting. At that time the advisory council identified the following next steps:

- The advisory council will form a subcommittee to engage with Florida Fish & Wildlife Conservation Commission Boating Advisory Council to:
 - Host a joint meeting / workshop, and
 - Present Florida Keys National Marine Sanctuary boating and boating education issues to the Boating Advisory Council.

Alternative Funding Mechanisms / User Fees – July 9, 2013

The advisory council reviewed and discussed user fees and alternative funding mechanisms at the July 9, 2013 advisory council meeting. The advisory council passed a motion to:

- Form a working group to examine alternative funding sources for the Florida Keys National Marine Sanctuary. The working group will examine:
 - Implementation,
 - Identify potential source of funds and amount that could be generated,
 - Identify funds needed and fund allocation, and
 - Enforcement.

(for the motion, see Appendix I).

1.0 Regulatory and Zoning Alternatives Development Work-Plan Items

1.1 Permit Procedures

FKNMS regulations have provided critical protection to key species and habitats in the sanctuary since those rules became effective in 1997. Changing environmental conditions and new activities occurring in the sanctuary that were not anticipated when the original rules were written necessitate an update to FKNMS regulations and permitting procedures. Changes proposed are based on lessons learned from fifteen years of implementation and in response to public scoping comments. The overall goal of this process is to clarify and streamline regulations, ensure consistency with other sanctuaries and authorities (e.g., state of Florida), and address new issues and activities that are occurring within the sanctuary.

Summary of Analysis and Draft Recommendations for Sanctuary Advisory Council Consideration

FKNMS staff has reviewed existing regulations and have identified the major categories and issues for potential modifications and/or potential new regulations. Categories and issues identified build on lessons learned from over 15 years of implementing FKNMS regulations, address issues not considered in the original Environmental Impact Statement and associated regulations, improve consistency with other National Marine Sanctuary sites and state regulations, respond to advisory council and community input received through the scoping process, and complement and strengthen the overall marine zoning and regulatory review process.

The advisory council discussed potential updates to FKNMS permit procedures at the February 19, 2013 meeting and the August 20, 2013 meeting.

For More Information

The Permit Procedures and Adaptive Management Presentations can be found on the sanctuary website. February 19, 2013 advisory council meeting presentation:

<http://floridakeys.noaa.gov/sac/othermaterials/130219permitprocedures.pdf>

and the August 20, 2013 advisory council presentation:

<http://floridakeys.noaa.gov/sac/othermaterials/130820permitamupdate.pdf>

Recommendation PP 1-5: Evaluate the following for economic and environmental benefit/impact.

ID	Evaluate for economic and environmental benefit/impact
PP-1	Create a new discharge exemption to allow dispersal of cremated human remains.
PP-2	Implement a prohibition on deserting or abandoning vessels and leaving harmful matter in vessels.
PP-3	Implement a prohibition on abandoning fishing gear.
PP-4	Clarify the discharge prohibition to address fish feeding by divers, vessels for hire,

	and in general except during fishing.
PP-5	Implement a prohibition on large boats using mooring buoys not specifically marked “large vessel.”

Recommendation PP 6-7: Consider the following administrative changes and identify and evaluate any potential economic and environmental benefit/impact.

ID	Consider administrative updates and evaluate for economic and environmental benefit/impact
PP-6	Update definitions and terminology to be consistent with state laws and Office of National Marine Sanctuary regulations. Categories include: boating restricted areas, anchoring impacts, existing management areas, submerged lands, nearshore construction definitions, littering, divers down, and protected wildlife.
PP-7	Modify requirements for Tortugas North Ecological Reserves Access Permits to allow requests for permits more than thirty days prior to any given trip and allow the permit to be valid for longer than two weeks. (At present access permits must be requested at least 72 hours but no longer than one month before the date the permit is desired to be effective and the permit is effective for a maximum of 2 weeks.)

1.2 Adaptive Management

Certain resource management issues including climate change, resilience, weather, disease, invasive species, or specific impacts from human activity may require rapid management response from FKNMS in coordination with appropriate state and federal resource managers. The existing tools for management response include issuance of permits, emergency regulations, and the standard rulemaking process. In addition, education, outreach, scientific investigation, and agency coordination occur to address resource management issues. However, in certain cases, there may still be a need for more specific and immediate regulatory action. Implementing an adaptive management framework is intended to allow more rapid and flexible response to threats impacting sanctuary resources.

The advisory council discussed options for adaptive management at the February 19, 2013 meeting and the August 20, 2013 meeting.

Adaptive Management Objectives:

1. Identify potential resource threats needing rapid management responses not available in the existing regulatory framework.
2. Develop, modify, or insert regulatory language to better respond to management challenges or resource protection issues.
3. Develop research and monitoring component to feed adaptive management measures
4. Allow greater flexibility in modifying zones to address changing resource management needs (e.g. standards for sunset).
5. Analyze incorporating existing management areas identified in the FKNMS Management Plan (i.e. Key Largo and Looe Key Existing Management Areas) into FKNMS zoning plan.

Summary of Analysis

Adaptive management is commonly used as a systematic process for improving environmental management policies and practices. Adaptive management as a strategy emphasizes the need to change with the environment and to learn from doing.

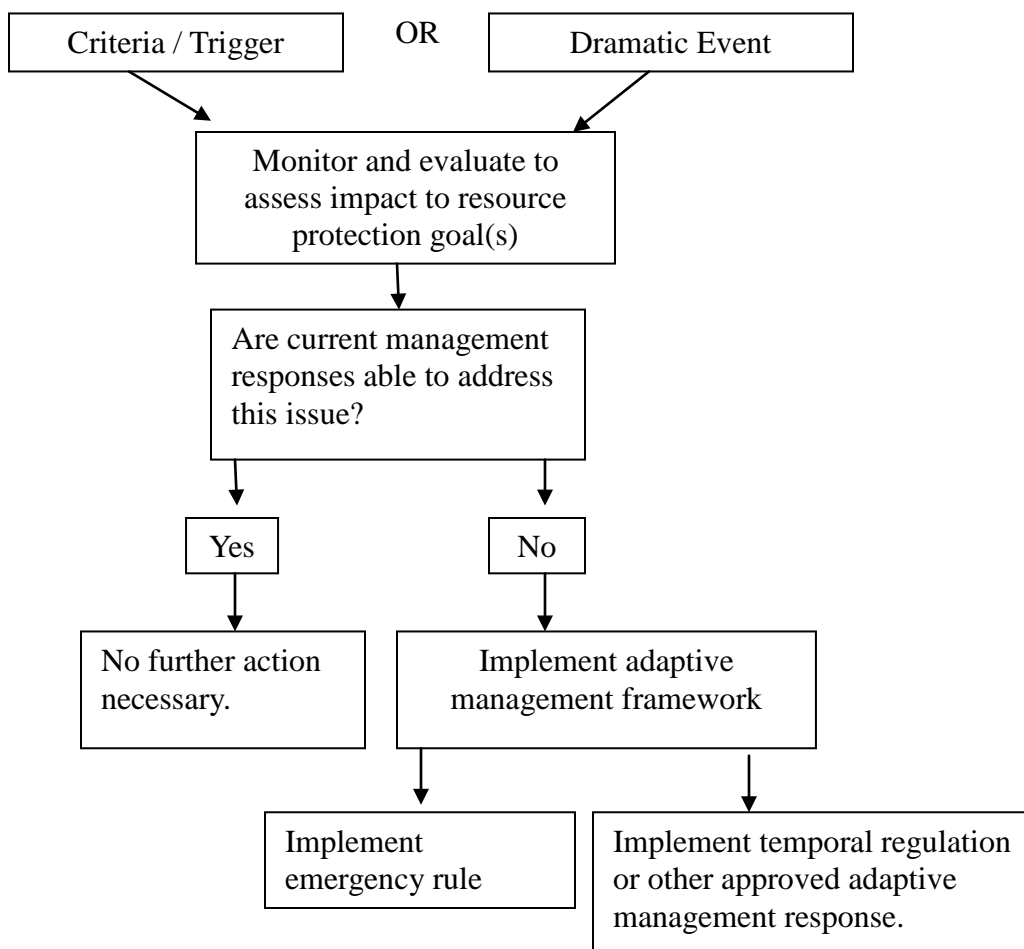
Implementation of an adaptive management framework in FKNMS could:

- Be criteria-driven, and will aim to prevent further resource declines;
- Be geographic in extent, with emphasis placed on areas where repeated resource issues are known to occur (e.g., coral bleaching hot spots);
- Complement permanent FKNMS regulations (sanctuary-wide and zone-specific);
- Be based on Council Goals and Objectives for FKNMS marine zoning and regulatory review;
- Supplement FKNMS emergency regulations by providing a procedure to address longer-term resource issues;
- Be based on FKNMS Condition Report trends for water, habitat, living resources, and maritime archaeological resources; and
- Include monitoring of management actions to guide future decision-making.

Designing and implementing an adaptive management framework for FKNMS could follow a four-step process:

1. Identify the issues or impact for management. Categories include:
 - Invasive or introduced species
 - Disease, die-offs or other dramatic environmental events
 - Changing landscape and/or wildlife effects
 - Human uses – chronic and/or unanticipated
 - New and intensified marine uses
2. Identify criteria / level of acceptable change.
3. Monitor for change.
4. Implement management action when accepted level of change is surpassed. Management actions could include:
 - Emergency Rule.
 - Temporal regulation, which could include additional zoning and zone specific regulations.
 - Other options as identified and evaluated through development of the Draft Environmental Impact Statement.

An adaptive management framework could be generally implemented as follows:



Draft Recommendations for Sanctuary Advisory Council Consideration

Recommendation AM 1-3: Identify and evaluate options for implementing an adaptive management framework in FKNMS.

ID	Identify and evaluate options for adaptive management
AM-1	Evaluate how an adaptive management framework could be designed and implemented to complement sanctuary regulations and strengthen the ability to more rapidly and flexibly respond to threats impacting sanctuary resources.
AM-2	Consider the following issues (identified by the advisory council at the February and August 2013 advisory council meetings) as triggers / criteria to drive adaptive management: <ul style="list-style-type: none"> • Restoration zones (i.e. zone management, identifying new zones, moving zones) • Exotic / invasive species • Species specific impacts following an event (i.e. hurricane or cold water event) • Climate Change Impacts <ul style="list-style-type: none"> ○ Sea level rise ○ Warming that triggers coral bleaching and/or disease • New or intensified marine uses
AM-3	Update the emergency regulations to allow a temporary regulation to be in effect for up to six months, with one six month extension. (At present the emergency rule duration is 60 days with up to one 60 day extension.)

For More Information

The Permit Procedures and Adaptive Management Presentations can be found on the sanctuary website. February 19, 2013 advisory council meeting presentation:

<http://floridakeys.noaa.gov/sac/othermaterials/130219permitprocedures.pdf>

and the August 20, 2013 advisory council presentation:

<http://floridakeys.noaa.gov/sac/othermaterials/130820permitamupdate.pdf>

1.3 Artificial Habitats

Artificial reefs and artificial habitats were both raised as issues during the public scoping process for this review including the need for better understanding of existing regulations and policies. FKNMS regularly receives proposals for placing structures on the seafloor including reef balls, statues, vessels, construction material, lost or damaged fishing gear, etc. Under the current regulatory and permitting structure and due to the lack of clear scientific understanding of the ecological impacts of artificial reefs, these proposals are analyzed on a case by case basis.

Summary of Analysis

A number of artificial reefs (primarily intentionally sunk ships) have been placed in the sanctuary. The impacts of these structures on fish and invertebrate populations, habitats, and the longevity and stability of these structures, are not

fully known. Limited research has occurred on the effects of artificial reefs in the sanctuary; as such, it is not clear that the placement of artificial reefs is consistent with the sanctuary's primary goal of resource protection. Accordingly, future policy and permitting decisions regarding artificial reefs within national marine sanctuaries will continue be made on a case-by-case basis consistent with the objectives for the site and the best available science. Some of the scientific issues that would be evaluated in any artificial reef permit application include:

- Attraction versus production
- Habitat conversion/alteration
- Range expansion
- Invasive species
- Disease introduction or acceleration
- Toxicological impacts
- Impacts to physical and chemical attributes of the ecosystem
- Longevity and structural integrity
- Human use and economic impacts

Artificial Habitat Objectives:

1. Determine need for clarification of artificial habitat / reef policies and procedures.
2. Determine need for potential "control" site for ecological research on artificial habitats.

Four specific activities to further understand potential benefits and impacts of artificial reefs to help determine if placement of artificial reefs is consistent with the goals and objectives of the sanctuary are outlined in the 2007 Management Plan. Permit holders are responsible for these investigations with oversight from FKNMS staff. They are:

- 1) Monitor Use Patterns on Existing Artificial and Natural Reefs Surrounding Sites for Sinking New Artificial Reefs. This effort will provide data and analysis to test the hypothesis that sinking a new artificial reef in a natural environment will reduce use on the surrounding natural reefs.
- 2) Investigate Impacts of Artificial Reefs on Fish and Invertebrate Populations for Long-term Management Including Location, Size, and Materials. The effects of artificial reefs on fish and invertebrate abundance and community composition and on other sanctuary resources will be assessed. The longevity of artificial reefs composed of different materials will be evaluated. Appropriate artificial reef locations will be determined, based in part on these findings.

- 3) **Monitor and Evaluate Habitat Modification Caused by the Installation of Artificial Reefs.** Information on habitat modifications caused by artificial reefs is a necessary element of evaluating consistency of artificial reefs with sanctuary goals and objectives. Soft sediments may be altered during installation of artificial reefs, and water flows around these structures are likely to continue to modify soft sediments and their associated communities. Nearby hard-bottom habitats may also experience modifications as a result of altered flows and other factors associated with artificial reefs.
- 4) **Assess and Develop Regulations for Artificial Reef Construction and Evaluate Habitat Suitability for Artificial Reefs.**

For More Information

Many of the management issues related to artificial reefs are discussed in recent publications by ONMS and highlight the need for additional science to determine whether there is an ecological benefit to sinking hard structure for the purposes of ecosystem benefits (http://sanctuaries.noaa.gov/science/conservation/artificial_reef12.html).

In addition to the above review by FKNMS staff, the Ecosystem Protection: Ecological Reserves / Preservation Areas and Wildlife Protection working group discussed and made recommendations related to artificial reefs. The advisory council reviewed the recommendations from this working group and unanimously forwarded them on to the Sanctuary Superintendent for further economic and environmental analysis. The Ecosystem Protection Working Group recommendations can be found here:

<http://floridakeys.noaa.gov/sac/othermaterials/20140819eprecommendations.pdf>

Draft Recommendations for Sanctuary Advisory Council Consideration

Studies from previously permitted projects to address ecological and sociological effects of artificial reefs have not been completed as required. Due to this limitation, the following recommendations are considered:

Recommendation AH 1-2: Identify key research needs and funding mechanisms to assess environmental and economic benefit /impacts of artificial habitats/reefs in a national marine sanctuary.

ID	Evaluate economic and environmental benefit/impact
AH-1	Create a Sanctuary Advisory Council sub-committee to serve as a liaison between the Sanctuary Advisory Council and the research community to identify targeted research needs and funding mechanisms to appropriately assess the benefits and impacts of artificial reefs.
AH-2	Evaluate alternatives including establishing control site(s) on existing artificial reefs to facilitate research on the four investigations identified in the 2007 Management Plan.

1.4 Water Quality

Water quality issues continue to be a critical resource management issue for FKNMS and are addressed extensively in the 2011 Condition Report. Water quality issues were also raised during the scoping period and through the regulatory review process by the Council, members of the public, organizations and by advisory council working groups.

FKNMS has a significant Water Quality Protection Program (WQPP) in place that has been functioning since the congressional legislation created FKNMS in 1990. The purpose of the WQPP is to recommend priority corrective action and compliance schedules addressing point and non-point sources of pollution; and to restore and maintain the chemical, physical, and biological integrity of the sanctuary. The WQPP is administered by the Environmental Protection Agency and Florida Department of Environmental Protection. Information about the WQPP can be found at <http://floridakeys.noaa.gov/wqpp/welcome.html> and http://ocean.floridamarine.org/FKNMS_WQPP/

Summary of Analysis

The WQPP reviewed all water quality issues raised through the public scoping process and identified the following categories of issues:

1. Water Quality Monitoring and Research
2. Water Quality Targets and Criteria
3. Sewage Treatment and Stormwater Runoff
4. Canal Restoration
5. Mooring fields/Liveboards//Pumpouts
6. Safe Beaches
7. Oceanic /Marine vessel discharges
8. Law Enforcement
9. Everglades Restoration and Florida Bay
10. Turbidity
11. Gulf of Mexico/Mississippi River
12. Mosquito Control
13. Endocrine Disruptors
14. Marine Debris
15. Climate Change/Ocean Chemistry

Water Quality Objectives:

1. Increase public participation and understanding of Water Quality Protection Program.
2. Identify any necessary regulatory modifications necessary to enforce prohibited discharges.

The WQPP addresses each of these issues in more detail including information on the current actions taken to improve and restore water quality and highlights future actions that are planned. The full document is included in Appendix II.

Draft Recommendations for Sanctuary Advisory Council Consideration

As noted in the WQPP summary document, the WQPP has resulted in significant accomplishments leading to documentable improvements in water quality in the Florida Keys marine ecosystem. The WQPP steering committee has met regularly for over 20 years to

identify and implement corrective actions, coordinate research and science activities and direct the scientific monitoring programs. With a long-standing WQPP in place, coordination among partners to ensure WQPP priority needs are implemented, monitored and reported on will continue and, where possible, additional funds will be sought and secured to advance efforts to address water quality in the Florida Keys.

For most of the 15 water quality issues, no regulatory recommendations have been identified. The following recommendation applies to water quality issue 7: Oceanic /Marine Vessel Discharge.

Recommendation WQ 1: Evaluate the economic and environmental benefit/impact of addressing discharge of gray-water in FKNMS

ID	Evaluate the economic and environmental benefit/impact
WQ-1	Implement regulation of gray-water discharges from cruise ships similar to other National Marine Sanctuaries.

1.5 Fishery Management Coordination

Several species specific issues were identified in the 2011 Condition Report and during public scoping meetings. While State and Federal fishery management bodies have species and complex specific management plans for many of the identified fish (i.e., goliath, gag, black, red grouper) which address fishery management issues, the advisory council, working groups, and public identified the need for greater clarification, simplification, and coordination of fishery management issues.

Previous to the current marine zoning and regulatory review, the advisory council has discussed and taken public comment regarding coordination of Florida Keys fisheries as well as development of a fishery management body which would address all fisheries in the Florida Keys and allow for greater local input by fisherman and consistency between federal and state fishery regulations in the Gulf of Mexico and South Atlantic. To this end, a Protocol for Cooperative Fisheries Management was developed in 1997 to improve coordination of fishing regulations in the Florida Keys (see Appendix V). This agreement recognized fisheries management authorities' continuation of management of fisheries under State law, the Magnuson-Stevens Fishery Conservation and Management Act, and other federal laws. The protocol was intended to address the recognized problem of inconsistent regulations within South Florida waters, which makes it difficult to coordinate, implement, and enforce management measures and creates public confusion while also hindering voluntary compliance. Specifically, the protocol allowed for fishing regulations to occur under FKNMS regulations and/or under Magnuson-Stevens Fishery Conservation and Management Act authority. The protocol also noted that if there is consensus, federal and state fishery management authorities may agree to develop uniform fishing regulations for South Florida species in state and federal waters of both the Gulf of Mexico and South Atlantic, including within the FKNMS.

To address fishery management coordination as part of this marine zoning and regulatory review process, the advisory council identified the following actions:

- Presentation and discussion by fishery managers from both FWC and NOAA regarding species specific issues raised in Condition Report and scoping meetings.
- Joint presentation by State and Federal fishery management staff to discuss ongoing efforts to better coordinate Gulf of Mexico, South Atlantic, and State of Florida fishery management activities and regulations for South Florida species.
- In coordination with FWC, NOAA, South Atlantic Fishery Management Council, and Gulf of Mexico Fishery Management Council, provide recommendations to the fishery management bodies to increase coordination, consistency, and local input regarding fisheries in the Florida Keys.
- Update the 1997 protocol as needed to implement changes in FKNMS fishing regulations.

Status of Fishery Management Coordination

The need for improved fishery management coordination for South Florida is recognized by FWC, NOAA and the South Atlantic and Gulf of Mexico Fishery Management Councils. To aid in coordination, a Joint Council Committee on South Florida Management Issues (Joint Committee) was established in response to a South Atlantic Fishery Management Council motion. The Joint Committee was first convened in January 2014 and is charged with evaluating and

developing options that increase coordination and consistency of fishery management and regulations in South Florida in general and for specific fish species.

Since its inception, the Joint Committee has had two meetings, January 7-9, 2014 in Key Largo and July 22-23, 2014 in Key Largo. The first meeting was focused on articulating the role and operating principles of the Joint Committee and identifying issues and species that the Joint Committee would address and was informed by a series of South Florida workshops hosted by FWC in August 2013. Following this meeting a Draft Options Paper describing procedural and other options to minimize conflicting regulations for South Florida species was developed, which was the focus of the second meeting.

The options paper identified specific species to consider managing as “South Florida” species (black grouper, gray snapper, hogfish, mutton snapper, yellowtail snapper, mangrove snapper, Nassau grouper, warsaw grouper, speckled hind, goliath grouper, gag, red grouper, and other shallow-water grouper) as well as procedural and other options to minimize or address regulatory inconsistencies. Procedural options considered range from creating separate and distinct catch limits for South Florida species under the authority of one or both of the Gulf of Mexico and South Atlantic Fishery Management Councils to delegating management responsibility for some or all South Florida species to the State of Florida. The Joint Committee also considered several species-specific measures to address inconsistencies in the interim.

Discussion at the second meeting of the Joint Committee focused on narrowing down the range of species, procedural and management options that might work best for each species; discussing primarily black grouper, gray snapper, hogfish, mutton snapper and yellowtail snapper. In addition, the Joint Committee established an Ad Hoc Goliath Grouper Joint South Florida Steering Committee to consider whether there is enough information to conduct a stock assessment for that species. This Ad Hoc Steering Committee met as part of the July 2014 meeting and passed a motion requesting a standard stock assessment for Goliath grouper, which will be conducted by the FWC. The Ad Hoc Steering Committee was then dissolved.

The Joint Committee plans to continue meeting to review additional information and analysis regarding options for South Florida fishery management, with the ultimate goal of recommending action to the Gulf and South Atlantic Fishery Management Councils. Their next meeting is scheduled for January 12-15, 2015 in Key West.

Any Committee recommendations adopted by the Councils would be subject to multiple public comment periods and reviewed by NOAA Fisheries for consistency with the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law prior to implementation.

Draft Recommendations for Sanctuary Advisory Council Consideration

The advisory council will continue to engage on issues of fishery management coordination for South Florida through regular updates from the respective agencies involved and, where possible, advisory council member attendance at Joint Committee meetings.

ID	Update Coordination Agreement & Engage with Fishery Management Bodies
FMC-1	As appropriate, provide recommendations to the fishery management bodies to increase coordination, consistency, and local input regarding fisheries in the Florida Keys.
FMC-2	Update the 1997 Protocol for Cooperative Fisheries Management as needed to implement changes in FKNMS fishing regulations.

2.0 Previous Advisory Council Actions

The advisory council has taken action on two work-plan items and identified four additional items for further discussion and focus as part of their 2013-2014 agenda. These issues include Study Areas and Boundary Modifications, Personal Water Craft Tours/ Fishing Conflicts, Law Enforcement, Education and Outreach, Vessel/Boating License and Education, and Alternative Funding Mechanisms/User Fees. The advisory council discussed, and in some cases took action, on each of these topics as follows:

- Study Areas and Boundary Modifications – reviewed and action taken at December 11, 2012 advisory council meeting.
- Personal Water Craft Tours / Fishing Conflicts – reviewed and action taken at December 11, 2012 advisory council meeting.
- Law Enforcement – reviewed at February 18, 2014 advisory council meeting with action taken at April 15, 2014 advisory council meeting.
- Education and Outreach – reviewed at April 16, 2014 advisory council meeting
- Vessel / Boating Licensing and Education – reviewed at August 20, 2013 advisory council meeting.
- Alternative Funding Mechanisms / User Fees – discussed and action taken at July 9, 2013 advisory council meeting.

2.1 Study Areas and Boundary Modifications

The FKNMS boundary was designated in 1990 and adjusted in 2001 to encompass additional areas in the Tortugas region. Increased knowledge of ecosystem connectivity, management efficiencies and the need to protect critical habitats adjacent to FKNMS were discussed in the 2011 Condition Report as well were raised by commenters in the public scoping meetings. For purposes of this marine zoning and regulatory review process, the advisory council considered a range of options for potential boundary modification.

Summary of Analysis and Sanctuary Advisory Council Discussions to Date

At the December 11, 2012 meeting, the advisory council identified the following areas to be included as part of the Study Area for the review process and for potential boundary modification options for further economic and environmental analysis (see Figures 2.1-1 and 2.1-2 for more detail):

Study Areas and Boundary Modifications Objectives:

1. Determine a study areas the area in which zoning discussions should occur.
2. Determine potential boundary modification alternatives for the purposes of environmental review.

Study Area 1: Area To Be Avoided (ATBA)

An ATBA is in place to prevent ships larger than 50 meters in overall length from transiting through sensitive areas in the sanctuary.

- Includes a small area north of Miami and areas along the reef tract that are outside the current sanctuary boundary.

Study Area 2: Particularly Sensitive Sea Area (PSSA)

PSSA are designated by the International Maritime Organization for special protection for ecological, socio-economic, or scientific reasons and their vulnerability to damage by international maritime activities.

- Includes areas where existing sanctuary regulations are applicable but that are outside the current sanctuary boundary,
- Incorporates the areas of the ATBA that are outside existing sanctuary boundaries,
- Bridges a gap in the middle southern part of FKNMS, and
- Extends to the Tortugas Ecological Reserve South.

Advisory Council Recommendation related to Study Area 2 at the December 11, 2012 Meeting: The advisory council added additional area to be considered (see Area 2a) to create a straight and squared off boundary. This recommendation is based on the assumption that such a boundary could enhance enforceability.

Study Area 3: Area between the sanctuary and Tortugas South Ecological Reserve

- Encompass additional PSSA area (see Study Area 2), and
- Close the gap between the current sanctuary boundary and a current zoned area of the sanctuary.

Study Area 4: Area north and west of Tortugas South Ecological Reserve

- Encompass additional important ecological features including the Tortugas Bank and banks adjacent to the Tortugas South Ecological Reserve boundary.

Study Area 5: Pulley Ridge

- Includes Pulley Ridge and portions that are designated as Habitat Area of Particular Concern (HAPC), and
- Considers ecological and oceanographic connectivity with sanctuary.

Study Area 6: Florida Bay south of the Everglades National Park

- Includes area south of the Everglades National Park,
- Recognizes a strong ecological and oceanographic connectivity with sanctuary, and
- Includes the portion of the Great White Heron National Wildlife Refuge outside the existing sanctuary boundary.

Advisory Council Recommendation related to Study Area 6 at the December 11, 2012 Meeting: The advisory council added additional area to be considered to (1) encompass a larger area where all general sanctuary regulations would apply and (2) create a straight and squared off boundary (see Area 6a). This recommendation is based on the assumption that such a boundary could enhance enforceability.

Previous Advisory Council Action

The advisory council reviewed and discussed the proposed Study Areas at the December 11, 2012 council meeting. At that time a motion was passed to include the following areas in the review process and in the economic and environmental impact analysis:

1. Consider the existing Study Areas as proposed (see figure 1.4-1)
2. Add additional areas including (see figure 1.4-2):

- a. make a straight line to connect Study Area 2 and 3 (see Study Area 2a), and
 - b. make straight lines to connect Study Area 4 and 6 (see Study Area 6a)
- (for the full motion, see Appendix I)

For More Information

The Study Areas and Boundary Modification presentation

(<http://floridakeys.noaa.gov/sac/othermaterials/121211studyarearecs.pdf>) and associated meeting notes (<http://floridakeys.noaa.gov/sac/minutes/121211minutes.pdf>) can be found on the sanctuary website

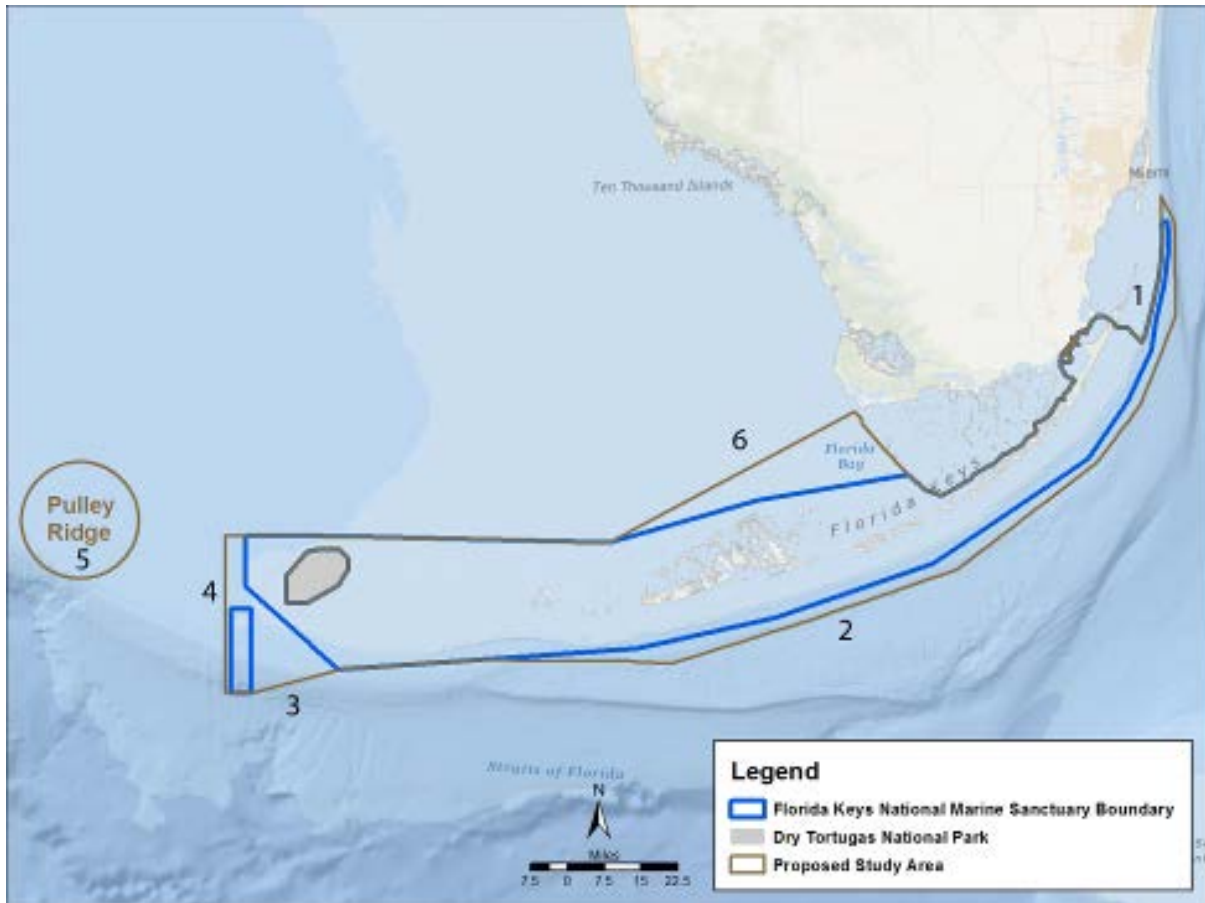


Figure 2.1-1. Study Areas presented to Sanctuary Advisory Council for consideration.

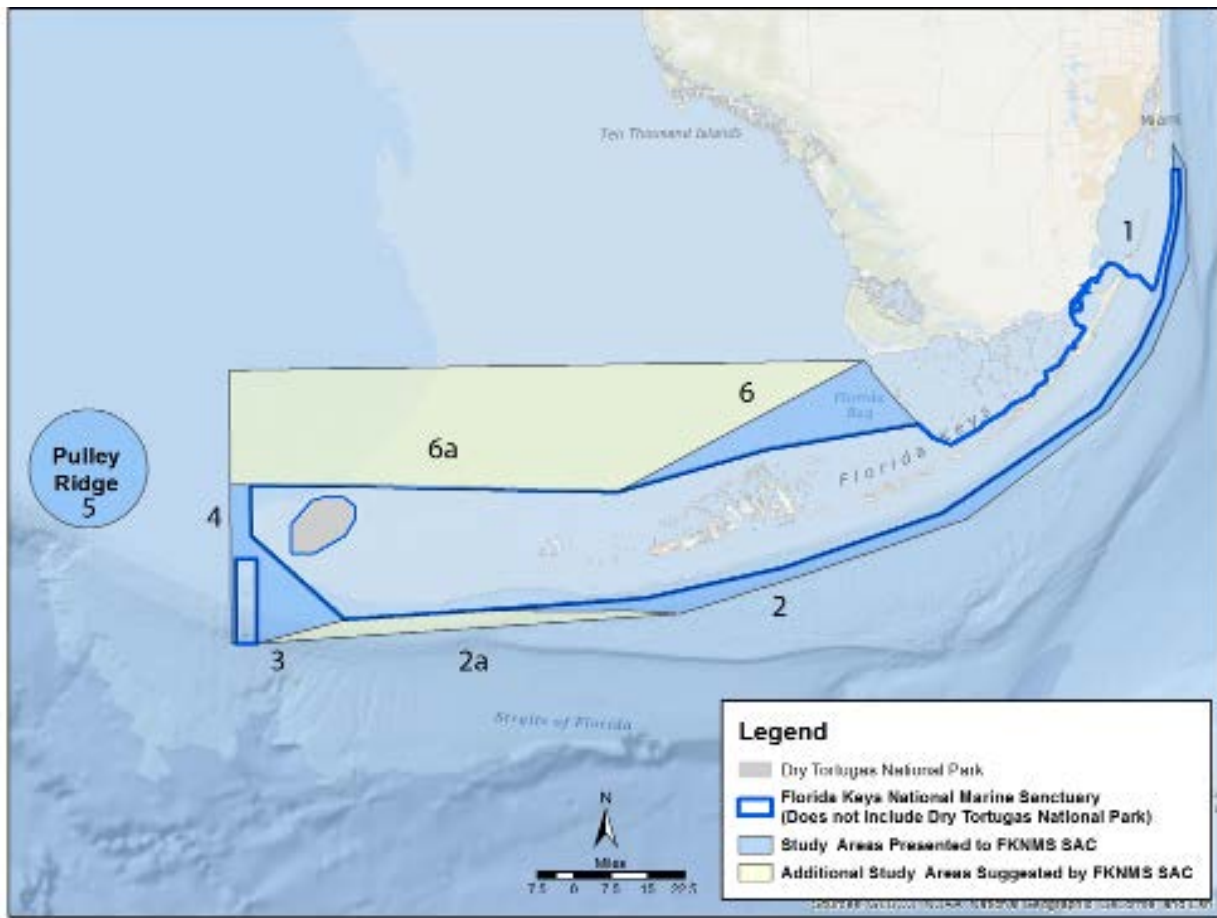


Figure 2.1-2. Study Area modifications made by the Sanctuary Advisory Council.

2.2 Personal Watercraft Tours/ Fishing Conflicts

Significant public comment was received during the public scoping period regarding personal watercraft (PWC) and the existing FKNMS and National Wildlife Refuge zones prohibiting use of PWC in the Great White Heron National Wildlife Refuge, Key West National Wildlife Refuge, and corresponding FKNMS zones. Public comments ranged from fully supporting current and/or additional regulations to opening all areas to unrestricted use of PWCs. Comments cited conflicts with fisherman, kayakers, and boaters, wildlife disturbance, behavior, operator conduct justifications.

Key West is home to multiple PWC tour operators that provide group excursions (5-15 people per tour), three to four times daily. During seasonal fish migrations, charter fishermen and PWC tours have conflicting interests that bottleneck at the main shipping channel near Ft. Zachary Taylor State Park (Figure 1.5-1 and 1.5-2). Because of regulations promulgated in the Florida Keys National Marine Sanctuary and Protection Act that prohibit the operation of a personal watercraft within the existing management areas of Great White Heron and Key West National Wildlife Refuges (15 CFR 922.164(b)(2)), PWC operators must not transit through that area.

PWC Tours/Fishing Conflicts Objectives:

1. Review and evaluate agreements addressing user conflicts.
2. Identify additional changes to zone boundaries if needed.
3. Review and evaluate recommendations in 2007 FKNMS Management Plan.

Summary of Analysis

In an effort to resolve seasonal user conflict, the PWC Co-Op and Lower Keys Fishing Guides Association (LKGA) held a series of meetings to discuss ways in which to improve the working relationship between parties, further mutual understanding, promote a healthier fishery and increase safety of PWC tours. The objective was to create a good faith agreement whereby both parties would jointly outline specific routes for PWC tours and guidelines for conduct, and agreement to meet periodically to ensure information is exchanged and agreement is upheld. The agreement was presented to the advisory council at the December 11, 2012 meeting. Figure 2.2-1 shows the various areas of use identified by the PWC Co-Op and LKGA including PWC route, PWC free-ride zones, and fishing areas.

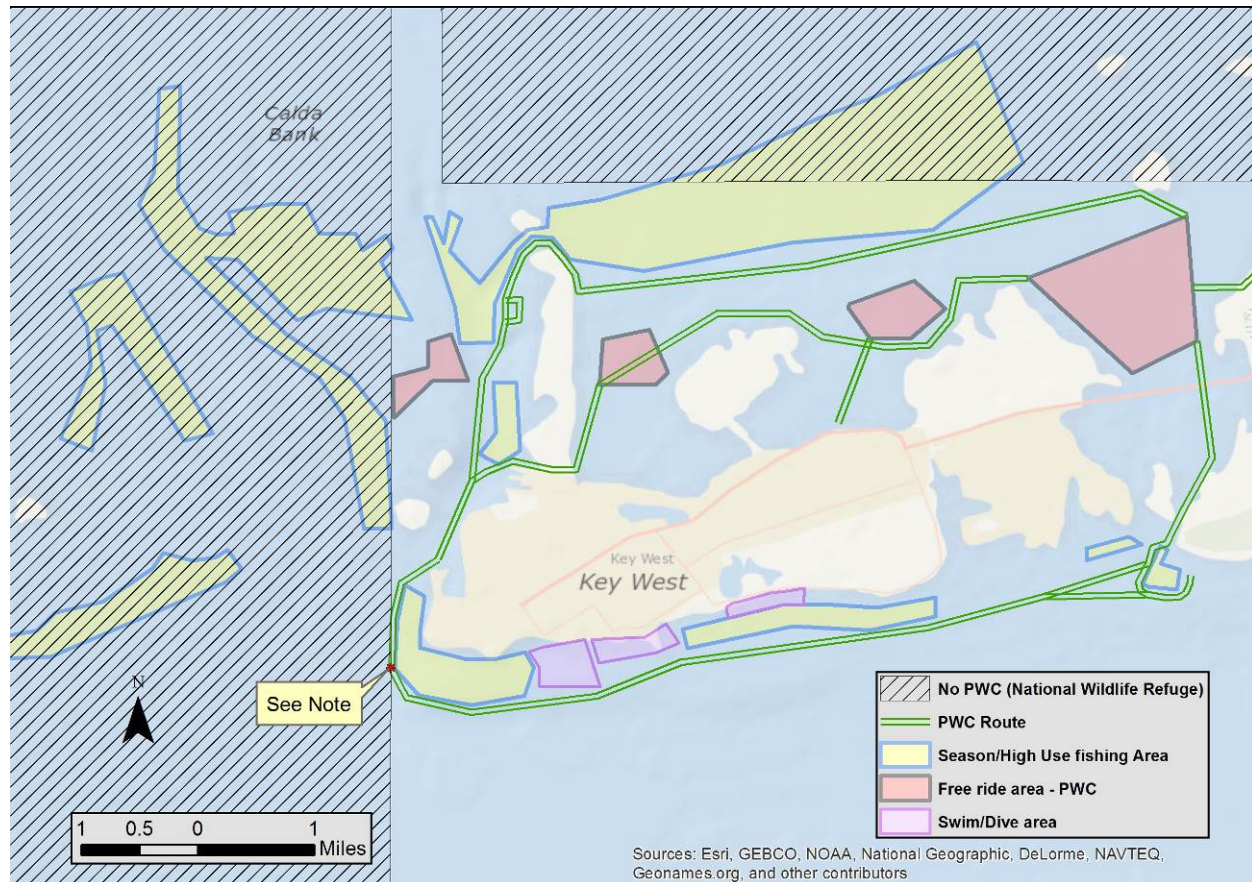


Figure 2.2-1. Areas of agreed upon use by PWC Co-Op and LKGA. The Note indicates area requested for relief of regulations to allow PWC operation. Map only shows Key West area, where the majority of commercial PWC operation occurs.

The PWC Co-Op and LKGA requested the following changes to existing FKNMS regulations:

- Relief of regulations to allow passage west of seasonal/high use fishing grounds in the instance that doing so will avoid conflict between fishing boats and PWC tours in the immediate area South and West of Fort Zachary Taylor. Specifically, recommended changes to the existing regulations are:
 - Open Key West National Wildlife Refuge and FKNMS to PWC such that PWC operators can go around the G13 marker (see Figure 1.5-2 for details).

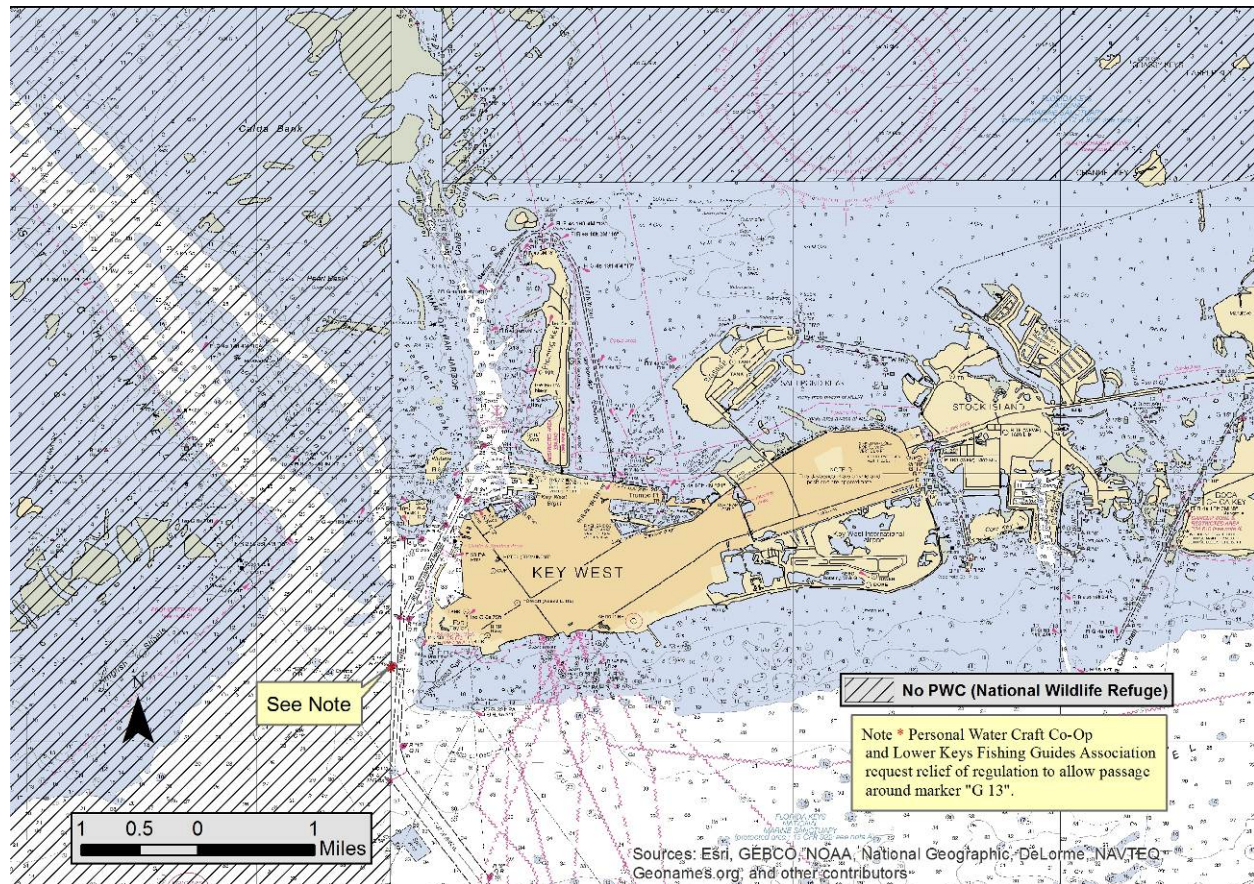


Figure 2.2-2. Detail of area requested for relief of regulations to allow PWC operation. Note indicates: PWC Co-Op and LKGA request relief of regulations to allow passage of PWC around marker “G13”.

Previous Advisory Council Action

The advisory council reviewed and discussed the PWC Co-Op and LKGA proposal at the December 11, 2012 council meeting. At that time a motion was passed to:

1. Include the agreement between the Lower Keys Guides Association and the Key West area PWC Co-op as part of the environmental and socioeconomic analysis in the draft Environmental Impact Statement (EIS).

(for the motion, see Appendix I)

The advisory council also requested that the 2007 Management Plan recommendations related to PWC be reviewed and evaluated (Florida Keys National Marine Sanctuary Advisory Council Regulatory and Zoning Alternatives Development Work-Plan, 2012).

For More Information

The PWC Co-Op and LKGA presentation

(<http://floridakeys.noaa.gov/sac/othermaterials/121211kwanglers.pdf>) and agreement

(<http://floridakeys.noaa.gov/sac/othermaterials/121211guideassoc.pdf>) can be found on the sanctuary website

2.3 Law Enforcement

Law enforcement continues to be identified as a significant resource management issue for FKNMS. The advisory council, working groups, and public identified the need for increased law enforcement presence in the sanctuary.

Summary of Analysis and Advisory Council Discussion

The February 18 advisory council meeting was dedicated to the issue of law enforcement in the sanctuary. Presentations were given by FKNMS staff, NOAA Offices of Law Enforcement and General Counsel, USCG, FWC, and U.S. Fish and Wildlife Service.

FKNMS works in partnership to implement the following law enforcement priorities:

- Develop Remote Observation Techniques to Aid Enforcement Efforts
- Develop Interagency Agreements Establishing Cross-agency Enforcement Authority
- Develop Standard Operating Procedures
- Develop a Standardized Training Program
- Develop System to Evaluate Effectiveness and Efficiency

Sanctuary staff compiled a summary of law enforcement partners, priorities, activities to date and future actions. See Appendix III for the full summary.

Previous Advisory Council Action

The advisory council reviewed and discussed the issue of enforcement within the sanctuary at the February 18, 2014 Council meeting. The advisory council unanimously passed a motion at the April 15, 2014 meeting (for the motion, see Appendix I).

2.4 Education and Outreach

More education and outreach is often cited as a need and solution to address many of the issues impacting sanctuary resources. The advisory council requested an update on the range of education and outreach programs and resources the sanctuary conducts.

Summary of Analysis and Advisory Council Discussions

The advisory council discussed the range of education and outreach activities that the sanctuary conducts at its April 16, 2013 meeting.

FKNMS stewardship and education programs seek to increase appreciation for and responsible use of the marine environment. The primary goals of the sanctuary education and outreach efforts are to:

- Promote protection and sustainable use of sanctuary resources;
- Promote public understanding of marine resources, and related watersheds;
- Promote public understanding of the national marine sanctuaries; and,
- Empower citizens with the necessary knowledge to make informed decisions that lead to the responsible stewardship of aquatic ecosystems.

Sanctuary staff compiled a summary of education priorities, activities to date and future actions. See Appendix IV for the full summary.

Previous Advisory Council Action

The advisory council reviewed and discussed general sanctuary education and outreach activities at the April 16, 2013 advisory council meeting. At that time no formal recommendations were made, however the advisory council identified the following need:

- Additional education and outreach materials if new zones are created through this review process and the means and possibility of measuring the effectiveness of education programs and materials.

For More Information

The FKNMS Education & Outreach presentation

(<http://floridakeys.noaa.gov/sac/othermaterials/130416fknmseducation.pdf>) can be found on the sanctuary website.

2.5 Vessel / Boating Licensing and Education

Direct impacts from vessels present a threat to the protection and health of sanctuary resources. Most of the impacts from vessel use correlate with the increasing number of vessels transiting within and around the sanctuary. More than 300 vessel groundings (vessels 50 feet or less; FKNMS unpub. data) are reported annually within the sanctuary, causing physical damage to sanctuary resources such as seagrass, hard-bottom, and coral reef habitats. In addition, there are a variety of direct impacts from smaller commercial and recreational vessels that may not result in actual groundings but still impact sanctuary resources.

The advisory council identified a need for additional boater education and potentially a boating licensing program to help address and alleviate the impacts from vessel damage in sanctuary waters.

Summary of Analysis and Advisory Council Discussions

The advisory council reviewed existing boater education programs and license requirements at the August 20, 2013 advisory council meeting. Highlights presented include:

Florida does not have a "boating license" however, Florida law (P.L. 327.395) requires that anyone who was born on or after Jan. 1, 1988 successfully complete an approved boating safety course and obtain a Boating Safety Education Identification Card issued by the FWC in order to operate a motorboat of ten (10) horsepower or greater. Upon successful completion of a course a Boating Safety Education Identification Card is issued. This card is valid for life, no further training is required. Visitors can get a temporary certificate in order to rent a boat or PWC.

A specific program discussed by the advisory council, the Eco-Mariner Program, targets vessel users operating in Florida Bay. The goal of this voluntary program is to provide boaters with the necessary knowledge to protect Florida Bay's sensitive environment. This voluntary program provides boaters an understanding of Florida Bay's geography, threats, protection, and regulations. Since its inception in 2009, there are approximately 1000 certified Eco-Mariners.

In addition, the USCG Auxiliary operates within the sanctuary and conducts vessel safety checks, harbor patrols, safe boating courses, search and rescue and marine environmental protection. FKNMS partners with USCG Auxiliary and the Eco-Mariner Program to provide information specific to sanctuary regulations and resource protection for their respective boater education courses.

Previous Advisory Council Action

The advisory council reviewed and discussed boater education programs in Monroe County and the state of Florida at the August 20, 2013 advisory council meeting. At that time the advisory council identified the following next steps:

- The advisory council will form a subcommittee to engage with Florida Fish & Wildlife Conservation Commission Boating Advisory Council to:
 - Host a joint meeting / workshop, and
 - Present Florida Keys National Marine Sanctuary boating and boating education issues to the Boating Advisory Council.

For More Information

The Boater Education and Licensing presentations given by the USCG (<http://floridakeys.noaa.gov/sac/othermaterials/130219cgaux.pdf>) and FKNMS (<http://floridakeys.noaa.gov/sac/othermaterials/130820boatereducation.pdf>) can be found on the sanctuary website.

2.6 Alternative Funding Mechanisms / User Fees

User fees to fund restoration projects or as part of boater licensing programs has been discussed by the advisory council as programs to consider. User fees include any fee, tax, or payment, direct or indirect that must be paid to a facility owner/operator by a facility user, as a condition of use of the facility. Examples include: National Park entrance fee, State Park camp-site fee, and highway tolls. The concept of user fees has been explored in the past and was not supported by the majority of commenters during the sanctuary designation process or through the development of the first sanctuary management plan. For this review process however, there were quite a few comments submitted through the public scoping process that supported exploring the use and implementation of user fees. The advisory council is exploring this option as a part of the current management plan review process.

Summary of Analysis and Advisory Council Discussions

The advisory council is considering implementation and administration procedures for the use of user fees as a mechanism to fund restoration, boating licensing, or training programs. In addition, two of the issue based working groups discussed the need for and potential options for implementing user fees. The Coral Reef Ecosystem Restoration Working group supported developing innovative partnerships to provide funding that supports restoration activities. The working group identified the following sources for collecting funds to support sanctuary management activities including donations, user fees, in-kind support for restoration practitioners, and mooring ball sponsorship programs. The Shallow Water Wildlife and Habitat

Protection working group discussed the option to create a fund to support shallow water habitat restoration activities.

The advisory council discussed the issue of user fees and alternative funding mechanisms at their August 20, 2013 meeting. Issues with administration of user fees were discussed including what entity would be designated to collect the funds, how and where are funds collected, what is the necessary funding to administer and enforce such a program, will the program be sufficient to generate a revenue stream, and how to design and implement a fair process to collect fees.

Previous Advisory Council Action

The advisory council reviewed and discussed user fees and alternative funding mechanisms at the July 9, 2013 Council meeting. The advisory council passed a motion to:

- Form a working group to examine alternative funding sources for the Florida Keys National Marine Sanctuary. The working group will examine:
 - Implementation,
 - Identify potential source of funds and amount that could be generated,
 - Identify funds needed and fund allocation, and
 - Enforcement.

(for the motion, see Appendix I).

For More Information

The Alternative Funding Mechanisms presentation

(<http://floridakeys.noaa.gov/sac/othermaterials/130709userfees.pdf>) can be found on the sanctuary website.

Appendix I: Advisory Council Marine Zoning & Regulatory Review Motions

II Resolution of the Florida Keys National Marine Sanctuary Advisory Council Advancing the Coral Reef Ecosystem Restoration Working Group Recommendations to NOAA for Analysis through a Draft Environmental Impact Statement

Motion Passed June 17, 2014

1. Whereas, The Florida Keys National Marine Sanctuary harbors a tropical marine ecosystem unique in the continental United States, including the world's third largest barrier coral reef, and
2. Whereas, this State and National environmental treasure experiences intensive usage by local residents and an estimated three million annual visitors to the region including recreational divers, recreational fishers, commercial fishers and boaters and it is subject to water pollution, and climate change impacts originating within and beyond the Sanctuary, and
3. Whereas, visitation and environmental usage are increasing with each passing year, and
4. Whereas, the Florida Keys National Marine Sanctuary Condition Report (2011) noted stable or declining trends in the abundance and distribution of habitat types, fair to poor status of the condition of habitats, and fair to poor status of human influence on habitat quality in the Florida Keys, and
5. Whereas, the Florida Keys National Marine Sanctuary Condition Report (2011) noted declining trends in the condition of living marine resources in the Sanctuary including fair to poor status of biodiversity, fair status of non-indigenous species, poor status of key species, and fair to poor status of the levels of human activities that might impact the quality of such resources, and
6. Whereas, the boundaries, zoning, and regulations of the FKNMS are currently under review and it is expected that this review will result in changes that will guide the future of the FKNMS to adapt to and to withstand the environmental impacts associated with increased usage that are inevitable and currently underway, and
7. Whereas, as part of this review, the Sanctuary Advisory Council created a Coral Reef Ecosystem Restoration Working Group charged with the following 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 (i.e. performance standards for sunset).

Therefore, the Sanctuary Advisory Council of the Florida Keys National Marine Sanctuary resolves as follows:

1. We acknowledge the commitment and contribution of Advisory Council and community members who served on the Coral Reef Ecosystem Restoration Working Group.
2. We request that the Coral Reef Ecosystem Restoration Working Group Recommendations are forwarded to the Sanctuary Superintendent for consideration and analysis as part of the Draft Environmental Impact Statement.
3. We request the following also be considered as part of the Draft Environmental Impact Statement:
 - Consider a range of protections necessary for coral nursery sites.

**I.II Resolution of the Florida Keys National Marine Sanctuary Advisory Council
Advancing the Shallow Water Wildlife and Habitat Protection Working Group
Recommendations to NOAA for Analysis through a Draft Environmental Impact
Statement**

Motion Passed June 17, 2014

1. Whereas, The Florida Keys National Marine Sanctuary harbors a tropical marine ecosystem unique in the continental United States, including the world's third largest barrier coral reef, and
2. Whereas, this State and National environmental treasure experiences intensive usage by local residents and an estimated three million annual visitors to the region including recreational divers, recreational fishers, commercial fishers and boaters and it is subject to water pollution, and climate change impacts originating within and beyond the Sanctuary, and
3. Whereas, visitation and environmental usage are increasing with each passing year, and
4. Whereas, the Florida Keys National Marine Sanctuary Condition Report (2011) noted stable or declining trends in the abundance and distribution of habitat types, fair to poor status of the condition of habitats, and fair to poor status of human influence on habitat quality in the Florida Keys, and
5. Whereas, the Florida Keys National Marine Sanctuary Condition Report (2011) noted declining trends in the condition of living marine resources in the Sanctuary including fair to poor status of biodiversity, fair status of non-indigenous species, poor status of key species, and fair to poor status of the levels of human activities that might impact the quality of such resources, and
6. Whereas, the boundaries, zoning, and regulations of the FKNMS are currently under review and it is expected that this review will result in changes that will guide the future of the FKNMS to adapt to and to withstand the environmental impacts associated with increased usage that are inevitable and currently underway, and
7. Whereas, as part of this review, the Sanctuary Advisory Council created a Shallow Water Wildlife and Habitat Protection Working Group charged with the following objectives:
 - Evaluate existing Wildlife Management Areas for effectiveness in protecting wildlife and their habitats under current as well as emerging public uses and environmental conditions; recommend status quo, modification, and/or new areas.
 - Develop recommendations considering existing regulations and zoning - mainly use of vessel restrictions on anchoring, speed, access, and channel marking - to further protect seagrass and critical shallow water habitats in FKNMS.
 - Address concentrated uses that diminish and destroy seagrass and shallow water habitats.
 - Identify where high impact activities known to occur should be allowed and encouraged for public and private uses.

- Identify seagrass and shallow water habitat areas for exclusion to allow for research control areas.
- Evaluate mangrove habitat protection for bird nesting.
- Reduce damage to natural resources from improper vessel salvage methods.

Therefore, the Sanctuary Advisory Council of the Florida Keys National Marine Sanctuary resolves as follows:

1. We acknowledge the commitment and contribution of Advisory Council and community members who served on the Shallow Water Wildlife and Habitat Protection Working Group.
2. We request that the Shallow Water Wildlife and Habitat Protection Working Group Recommendations are forwarded to the Sanctuary Superintendent for consideration and analysis as part of the Draft Environmental Impact Statement.
3. We request the following also be considered as part of the Draft Environmental Impact Statement:
 - Ensure channels remain open for navigation, noted in particular Vaca Cut.
 - Consider mechanisms, including working with appropriate other management entities, to address emerging areas of concentrated use that could damage shallow water habitat.
 - Ensure clear rationale including the problem, goal, solution for any zone modification (noted in particular Tarpon Wildlife Migration Zone, East and West Baracutta Key Flats, and Marquesas Keys Zone).
 - For areas identified to protect turtle resources, consider other ways to meet this resource protection goal.
 - Consider proper marking of zones.
 - Consider the area of Pelican Key on the bayside (MM98) for a potential new zone. Resource protection needs include wading and frigate birds. In addition, this is a high use area.

**I.III Resolution of the Florida Keys National Marine Sanctuary Advisory Council
Advancing the Ecosystem Protection: Ecological Reserves / Preservation Areas and Wildlife
Protection Working Group Recommendations to NOAA for Analysis through a Draft
Environmental Impact Statement**

Motion Passed August 19, 2014

1. Whereas, The Florida Keys National Marine Sanctuary harbors a tropical marine ecosystem unique in the continental United States, including the world's third largest barrier coral reef, and
2. Whereas, this State and National environmental treasure experiences intensive usage by local residents and an estimated three million annual visitors to the region including recreational divers, recreational fishers, commercial fishers and boaters and it is subject to water pollution, and climate change impacts originating within and beyond the Sanctuary, and
3. Whereas, visitation and environmental usage are increasing with each passing year, and
4. Whereas, the Florida Keys National Marine Sanctuary Condition Report (2011) noted stable or declining trends in the abundance and distribution of habitat types, fair to poor status of the condition of habitats, and fair to poor status of human influence on habitat quality in the Florida Keys, and
5. Whereas, the Florida Keys National Marine Sanctuary Condition Report (2011) noted declining trends in the condition of living marine resources in the Sanctuary including fair to poor status of biodiversity, fair status of non-indigenous species, poor status of key species, and fair to poor status of the levels of human activities that might impact the quality of such resources, and
6. Whereas, the boundaries, zoning, and regulations of the FKNMS are currently under review and it is expected that this review will result in changes that will guide the future of the FKNMS to adapt to and to withstand the environmental impacts associated with increased usage that are inevitable and currently underway, and
7. Whereas, as part of this review, the Sanctuary Advisory Council created an Ecosystem Protection: Ecological Reserves / Preservation Areas and Wildlife Protection Working Group charged with the following objectives:
 - Review and evaluate existing reserves designated for protection of coral reef ecosystems.
 - Review current exceptions to regulations in Sanctuary Preservation Areas and Ecological Reserves.
 - Review and evaluate Sanctuary Preservation Areas reduction of conflicting uses.
 - Recommend new or modified ecological reserves to ensure protection of a diversity of resources:
 - Spawning aggregations;
 - Full suite of marine flora and fauna (i.e., seabird, marine mammal, turtles, seagrass, soft corals, hard corals)

- Consider temporal zoning to address seasonal impacts associated with intense uses or seasonal ecological activities (i.e., nesting, breeding, spawning).
- Ensure the FKNMS zoning scheme promotes sustainable use of the sanctuary resources and protects areas that represent diverse habitats as well as areas important for maintaining natural resources and ecosystem functions.

Therefore, the Sanctuary Advisory Council of the Florida Keys National Marine Sanctuary resolves as follows:

1. We acknowledge and applaud the commitment and contribution of Advisory Council and community members who served on the Ecosystem Protection: Ecological Reserves / Preservation Areas and Wildlife Protection Working Group.
2. We request that the Ecosystem Protection: Ecological Reserves / Preservation Areas and Wildlife Protection Working Group Concepts and Recommendations are forwarded to the Sanctuary Superintendent for consideration and analysis as part of the range of alternatives in the Draft Environmental Impact Statement.
3. We request the following also be considered as part of the Draft Environmental Impact Statement:
 - Determine the additional area that is captured in working group zone recommendations. Evaluate if that is enough, not enough, or too much area proposed to be zoned.
 - Evaluate the use of user fees as a tool to support resource management.
 - Evaluate the purpose and intent of the working group recommendation “closed to all uses”. Consider exemption to allow research activities, purposeful monitoring of zones, and develop a plan to allow resource management activities (e.g. invasive species, restoration).
 - Consider EP-2 recommendation to create a new zone at Turtle Rocks and the potential impact to cultural resources and associated research activities.
 - Consider EP-6 recommendation to modify the zone at Alligator Reef and evaluate impact to user groups.
 - Evaluate additional areas or other ways to meet the SAC Goals to protect large, contiguous, diverse, and interconnected habitats (SAC Goal 2).
 - Evaluate the effectiveness of restricting access by making no anchor/mooring balls only areas. Evaluate options related to time limit for mooring ball use.
 - Evaluate options to allow pole spear fishing for lionfish in state waters (noted in particular for the Upper Keys region). Evaluate options to address lionfish throughout the Sanctuary.
 - Include an alternative that evaluates large marine zones, (e.g 25 square nautical mile zones, 20% of Sanctuary area), designed to limit and/or eliminate user impact on the ecosystem.
 - Evaluate a marine zone at Snapper Ledge.
 - Evaluate the use of a voluntary education program (using Everglades Eco-Mariner as a model) to address boater education.

I.IV Motion for Study Area and Boundary Modifications

Motion passed December 11, 2012

Study Area in the vicinity of existing Florida Keys National Marine Sanctuary boundary

Mr. Barras moved, seconded by David Makepeace, to box out the study area, bringing the line straight across on the south part and straight across from number six, the dorsal fin, down to number four.

After a count of the numbers of fingers held up by SAC members, Chair Nedimyer deemed the motion passed. Below is the final text approved by the motion.

To box it [the main study area proposed by Mr. Hunt] out; bring that line straight across on the south part and straight across from number six, the dorsal fin, down to number four.

Mr. Makepeace moved, seconded by Ms. Garlo, to have Pulley Ridge included with the wording Mr. Hunt talked about, leaving it to the managers to work out.

Study Area in the vicinity of Pulley Ridge

After a count of the numbers of fingers held up by SAC members, Chair Nedimyer deemed the motion passed. Below is the final text approved by the motion.

To have Pulley Ridge included with the wording Mr. Hunt talked about, leaving it to the managers to work out.

For More Information

The Study Areas and Boundary Modification presentation

(<http://floridakeys.noaa.gov/sac/othermaterials/121211studyarearecs.pdf>) and associated meeting notes (<http://floridakeys.noaa.gov/sac/minutes/121211minutes.pdf>) can be found on the sanctuary website

I.V Motion for Personal Watercraft Tours / Fishing Conflicts

Motion passed December 11, 2012

After a count of the numbers of fingers held up by SAC members, Chair Nedimyer deemed the motion passed. Below is the final text approved by the motion.

The SAC recommends to the staff that they include in the draft Environmental Impact Statement consideration of the agreement between the Lower Keys Guides Association and the Key West area PWC operators.

For More Information

The PWC Co-Op and LKGA presentation

(<http://floridakeys.noaa.gov/sac/othermaterials/121211kwanglers.pdf>) and agreement (<http://floridakeys.noaa.gov/sac/othermaterials/121211guideassoc.pdf>) can be found on the sanctuary website

**I.VI Resolution of the Florida Keys National Marine Sanctuary Advisory Council
Advocating Continued and Strengthened Support for Law Enforcement within Florida
Keys National Marine Sanctuary**

Motion passed April 15, 2014

1. Whereas, The Florida Keys National Marine Sanctuary harbors a tropical marine ecosystem unique in the continental United States, including the world's third largest barrier coral reef, and
2. Whereas, this State and National environmental treasure experiences intensive usage by local residents and an estimated three million annual visitors to the region including recreational divers, recreational fishers, commercial fishers and boaters and it is subject to water pollution, and climate change impacts originating within and beyond the Sanctuary, and
3. Whereas, visitation and environmental usage are increasing with each passing year, and
4. Whereas, the need for ecological restoration, effective management, and adequate enforcement of Sanctuary regulations including marine zoning, water quality protection and others, is ever increasing as usage and environmental decline increases, and
5. Whereas, the boundaries, zoning, and regulations of the FKNMS are currently under review and it is expected that this review will result in changes that will guide the future of the FKNMS to adapt to and to withstand the environmental impacts associated with increased usage that are inevitable and currently underway, and
6. Whereas a 1997 FEIS study for the FKNMS management plan indicated the need for a total combined law enforcement presence in the FKNMS of 43 uniformed sanctuary officers, and
7. Whereas, in 2001 there were 17 law enforcement officers, which was the highest number ever reached for enforcement officers dedicated to sanctuary enforcement; at this time there are 6 officers, which is the lowest number since the establishment of FKNMS, and
8. Whereas there is an ever growing outcry from all user groups to have a more robust marine law enforcement presence on and around the 2,900 square nautical miles that comprise the FKNMS, and
9. Whereas, the funding, presence, and activity of the law enforcement agencies tasked with enforcement of the laws and regulations that protect the fragile environment and resources of the FKNMS need to be enhanced to adequately meet current and future needs.

Therefore, the Sanctuary Advisory Council of the Florida Keys National Marine Sanctuary resolves as follows:

1. We express continued strong support for the state and federal agencies providing marine law enforcement resources and strongly support further expansion of coordinated agency enforcement programs within FKNMS. The FKNMS SAC recommends that NOAA and

the Office of National Marine Sanctuaries (ONMS) continue to partner with other agencies to develop and implement effective management and enforcement techniques within FKNMS. The continued development of these partnerships and inter-agency coordination assists all involved in developing a proactive and effective enforcement capability to protect the natural and cultural marine resources of south Florida and the Florida Keys.

2. We encourage NOAA's OLE to include FKNMS enforcement priorities in the Joint Enforcement Agreement
3. We request that NOAA's OLE continue to support NOAA Special Agents in the Florida Keys, and that they consider adding uniformed law enforcement personnel to the Florida Keys.
4. We request that ONMS continue providing adequate resources for these programs, and to support the acquisition of additional personnel and equipment needed to enforce sanctuary regulations.
5. We request a careful and detailed review of the current and future enforcement needs of the FKNMS be completed as part of the Draft EIS, We also request that the Florida FWC re-establish a dispatch center in the Florida Keys to facilitate better law enforcement response capabilities in the FKNMS.
6. Education is an important component toward helping the boating public comply with sanctuary regulations, so we request that FKNMS and ONMS expand its education and outreach capabilities to include signage along the 18 mile stretch, additional signage at popular boat entry locations, and enhanced presence of on the water sanctuary information programs such as Team O.C.E.A.N.
7. We encourage FKNMS and ONMS to work with the popular GPS manufacturers to develop enhanced digital charts for chart plotters that would include real time information about the zones mariners are passing through.
8. We encourage FKNMS and ONMS to look into having a smart phone app developed that would give real time information about the most important sanctuary regulations in place for various locations in the sanctuary. This could be a Hollings grant through the National Marine Sanctuary Foundation.

We resolve to request that the Superintendent forward this resolution to the Director of the office of National Marine Sanctuaries and to the Assistant Administrator for NOAA's Ocean Service.

I.VII Motion of the Florida Keys National Marine Sanctuary Advisory Council to examine Alternative Funding Sources for Sanctuary Management

Motion Passed July 9, 2013

Motion: The Sanctuary Advisory Council will form a working group to examine alternative funding sources for the Florida Keys National Marine Sanctuary. Working group will examine:

- Implementation,
- Identify potential source of funds and amount that could be generated,
- Identify funds needed and fund allocation, and
- Enforcement.

Appendix II: Summary of Water Quality Protection Program Activities

Background

The Florida Keys National Marine Sanctuary (FKNMS) Water Quality Protection Program (WQPP) is a collaborative effort by federal, state and local governments, elected officials, non-governmental organizations, academics and local citizens dedicated to protecting and improving water quality, coral reefs, seagrasses, fisheries and recreational opportunities within the FKNMS. In 1990, Congress designated the nearly 2900 square nautical miles of waters surrounding the Florida Keys as a national marine sanctuary by passing the Florida Keys National Marine Sanctuary and Protection Act (Public Law 101-605). Recognizing the critical role of water quality, Congress directed the Administrator of the U.S. Environmental Protection Agency (EPA) and the Governor of the State of Florida (Florida Department of Environmental Protection (FDEP), in consultation with the Secretary of Commerce (National Oceanic Atmospheric Administration (NOAA)), to establish a comprehensive WQPP for the sanctuary.

The purpose of the WQPP is to identify and implement priority corrective actions to address point and nonpoint sources of pollution in order to maintain the chemical, physical and biological integrity of the sanctuary; and to restore and maintain balanced indigenous populations of corals, shellfish, fish and wildlife, and recreational activities in and on the water.

The WQPP consists of four interrelated components: 1) corrective action, 2) monitoring, 3) research/special studies and 4) public education/outreach. The WQPP is administered by EPA and FDEP, in cooperation with NOAA. The framework for administration consists of the following: Water Quality Steering Committee, Water Quality Management Committee and EPA Liaison Office, Water Quality Technical Advisory Council and the Florida Keys National Marine Sanctuary Advisory Council (Council) (http://ocean.floridamarine.org/FKNMS_WQPP/index.html).

Steering Committee

Policy and guidance for the WQPP is provided by the steering committee, an interagency body that operates by consensus and is comprised of representatives from federal, state, and local governments, non-governmental organizations and informed citizens. The steering committee works in conjunction with the Council on water quality matters and receives input from two standing WQPP committees, the Management Committee and the Technical Advisory Committee. Together, the WQPP and its partner agencies have developed a program that reduces pollution, ensures compliance with state and federal laws, has adopted appropriate water quality standards, identifies funding sources, and provides a mechanism for state and local government consultation and public participation.

The WQPP has supported and funded long-term research and monitoring programs that track water quality, coral reef and seagrass communities; results from monitoring and research studies have been instrumental in decision-making and in determining what actions are needed to sustain a healthy ecosystem.

Funding

Since the WQPP was implemented more than 20 years ago, over 18.5 million dollars have been appropriated by Congress and administered by the EPA in accordance with the Florida Keys National Marine Sanctuary and Protection Act. Scientific monitoring of water quality, seagrass and coral reef communities and species studies projects have received approximately 17 million of the total funds. Wastewater and stormwater improvements on the Keys islands have been funded through taxes at the local level, state appropriations and revolving loans and other means, including appropriations from Congress through the Florida Keys Water Quality Improvement Program. This program, administered through the US Army Corps of Engineers, received a total of 42 million.

Water Quality Protection Program Activities and Accomplishments

The WQPP has resulted in significant accomplishments leading to documentable improvements in water quality in the Florida Keys marine ecosystem. The WQPP steering committee has met regularly for over 20 years to identify and implement corrective actions, coordinate research and science activities and direct the scientific monitoring programs. Highlights from the WQPP are described in the WQPP Biennial Report to Congress 2012

(http://ocean.floridamarine.org/fknms_wqpp/pages/wqpp.html).

The following programs/plans are in place in the Florida Keys to protect, restore and maintain water quality and will be discussed in more detail throughout this document.

- **Wastewater Management**—The Monroe County Sanitary Wastewater Master Plan was implemented in 2000 to meet state statutes that call for the use of advanced wastewater/best available treatment throughout the county (<http://fl-monroecounty.civicplus.com>). By mid- 2013, nearly 70% of all residences/businesses have upgraded to meet the requirements and more than \$380 million dollars had been spent. This has resulted in a reduction of nutrient inputs into near shore waters of the Keys as described by five Reasonable Assurance Documents (RADs) as part of the Florida Keys Reasonable Assurance Plan (RAP).
- **Stormwater Management**—The Monroe County Stormwater Management Master Plan, completed in 2001, contains management actions being applied to reduce stormwater runoff into near shore waters (<http://www.monroecounty-fl.gov/index.aspx?NID=151>). The City of Marathon has successfully combined its stormwater collection and treatment with its wastewater collection system. The City of Key West has implemented its own Stormwater Master Plan that has resulted in improvements in managing runoff and improving drainage (<http://www.keywestcity.com/department/division.php?structureid=162>).
- **Vessel Sewage**—To eliminate sewage inputs from vessels into sanctuary waters, the Florida Keys National Marine Sanctuary adopted a regulation that prohibits discharging any waste from a marine sanitation device (MSD). Boaters must use a pumpout facility and must keep the MSD device locked while in sanctuary waters at all times. The Cities of Marathon and Key West now have a comprehensive mooring field program that provides mobile pumpout services to liveaboard and transient boating community.

Mobile pumpout services are available at no charge for all recreational and liveaboard vessels living throughout the Keys. This service is made possible using funds from the Clean Vessel Act administered through FDEP and matched by Monroe County (<http://fl-monroecounty.civicplus.com/index.aspx?NID=442>).

- **Monitoring and Research**—The research studies and monitoring programs conducted for nearly 20 years have yielded scientific information that serves as the basis for effective management of sanctuary coral reefs, seagrass meadows and water quality (http://ocean.floridamarine.org/fknms_wqpp/index.html). Results from the water quality monitoring indicate that overall water quality within the sanctuary is good, but elevated nitrogen levels near shore point to a land-based source. In addition, monitoring of the seagrass community has shown trends in seagrass density and cover that are consistent with increased nutrient availability in the water column. Monitoring of coral reefs in sanctuary waters has documented declines in stony coral cover and the increase of soft corals in some locations where stony corals once lived. Good water quality is essential for sustaining coral reefs; however, declines observed in coral reefs are due to several factors, including global climate change, not just land-based sources of nutrients.
- **Education/Outreach**—Education and outreach conducted by sanctuary staff and their partners have been critical in conveying information about water quality and the marine ecosystem. One outreach tool sponsored by WQPP is *Waterways*, a successful television series that highlights the environmental and cultural resources of south Florida (<http://floridakeys.noaa.gov/whatsnew/around/2013/waterways.html>). *Waterways*, which is produced under the direction of FKNMS, the National Park Service and EPA, has broadcast over 200 episodes since the program first aired in 1994. Another important outreach product has been *Tropical Connections*, a comprehensive book describing what is known about south Florida's marine ecology and recommends management priorities for the future. (<http://www.umces.edu/release/2012/jul/24/tropical-connections-south-floridas-marine-environment>).

Water Quality Issues Overview and Important Documents

In 2012, EPA published the Water Quality Protection Program biennial report to Congress that describes the accomplishments, programs and details of the WQPP (http://ocean.floridamarine.org/fknms_wqpp/pages/wqpp.html). Significant progress has been made by local, state and federal agency partners in improving wastewater and stormwater management in the Florida Keys. The details of many management actions being taken throughout the Keys are provided in five Reasonable Assurance Documents (RADs 2008, 2011) that together describe the Reasonable Assurance Plan (RAP) for dealing with nutrient pollution from local land-based sources (<http://www.dep.state.fl.us/water/watersheds/rap.htm>). The 2008 RADs outline plans to improve wastewater and stormwater and the 2011 RAD addresses Keys waters that need improvements related to dissolved oxygen levels in Keys waters. Many of the pressures on sanctuary water quality and responses to those pressures are described in the sanctuary's first Condition Report, 2011 (<http://floridakeys.noaa.gov/scipublications/condition.html>).

Marine Zoning and Regulatory Review – Addressing Water Quality Scoping Comments

The purpose of this document is to provide information and additional resources on water quality topics noted during the public scoping process for the sanctuary's marine zoning and regulatory review. The specific water quality issues identified through public scoping have been categorized into 15 main issue areas. Each of the 15 issue areas are individually addressed and include information on the current actions taken to improve and restore water quality and highlights future actions that are planned.

The fifteen main categories identified through the scoping process are:

1. Water Quality Monitoring and Research
2. Water Quality Targets and Criteria
3. Sewage Treatment and Stormwater Runoff
4. Canal Restoration
5. Mooring fields/Liveaboards//Pumpouts
6. Safe Beaches
7. Oceanic /Marine vessel discharges
8. Law Enforcement
9. Everglades Restoration and Florida Bay
10. Turbidity
11. Gulf of Mexico/Mississippi River
12. Mosquito Control
13. Endocrine Disruptors
14. Marine Debris
15. Climate Change/Ocean Chemistry

1. Water Quality Monitoring and Research

Several commenters expressed concerns about monitoring and research studies taking place in sanctuary waters and about the sanctuary's Water Quality Action Plan (in FKNMS Management Plan, 2007). Some commenters urged the sanctuary to use scientific research results to develop specific actions as part of the sanctuary's Water Quality Action Plan. It was noted that such actions are especially critical to promote the long-term survival of corals under changing global conditions. Another commenter stated that minimal action has been taken by the sanctuary in terms of using the research and monitoring studies to implement tangible management actions designed to improve conditions. A few commenters suggested conducting research studies on sponges and their impacts on water quality, including closing off areas to spongers to see whether water quality will improve.

Current Actions

Water Quality Action Plan: The sanctuary's Water Quality Action Plan was developed with input from the public, FDEP, EPA and other agency partners in the sanctuary's Water Quality Protection Program (WQPP) and appears in the Sanctuary's Management Plan 2007 (<http://floridakeys.noaa.gov/mgmtplans/2007.html>). NOAA and the WQPP partners agree that the action plan has the basic framework in place to address the most critical topics, but also

recognize that the plan needs to be updated to reflect the current and planned management activities designed to improve water quality. In accordance with the Reasonable Assurance Plan (RAP), Monroe County and local municipalities are responsible for implementing improvements in treating wastewater and stormwater with oversight from FDEP and EPA (<http://www.dep.state.fl.us/water/watersheds/rap.htm>). The resulting reduction of nutrient pollution from local land-based sources is expected to reduce stressors on coral reef communities.

WQPP Research and Monitoring Studies: The WQPP has supported research and monitoring studies that have tracked the condition of seagrass meadows, coral reefs and water quality for nearly 20 years, giving special emphasis to the effects of nutrients on these resources. The results from these studies have provided important information when considering management actions to improve water quality. Water quality monitoring data showed a consistent pattern of elevated nitrate levels in near shore waters, which pointed to land-based nutrient pollution, most likely from untreated sewage and runoff (http://ocean.floridamarine.org/fknms_wqpp/pages/wqmp.html, <http://serc.fiu.edu/wqmnetwork>). This information supported the need for wastewater upgrades (most of which are complete) and the prohibition on discharging vessel sewage throughout the sanctuary. Water monitoring and research quality data were critical in developing the nutrient targets for near shore waters that are required by the RAP. Targets are expected to be met by 2020 after all wastewater and stormwater upgrades have been completed (see Water Quality Targets and Criteria section). Long-term monitoring data were also used to develop water quality and seagrass indicators and have been useful in tracking trends in nutrient availability over time (<http://floridakeys.noaa.gov/scisummaries/welcome.html?s=science>) (see Water Quality Targets and Criteria section).

The WQPP and its partners have also supported 30 special studies to address specific management questions and concerns (http://ocean.floridamarine.org/fknms_wqpp/pages/special_projects.html). One special study, the Little Venice Water Quality Monitoring Project, examined water quality changes in canals in a neighborhood before and after advanced wastewater treatment was implemented. Findings show a decrease in violations in dissolved oxygen levels and bacteria levels in canal waters (http://ocean.floridamarine.org/fknms_wqpp/pages/special_projects.html). Another study tracked the seagrass community at canal entrances. With the implementation of Advanced Wastewater Treatment (AWT) in this canal neighborhood, changes in the kinds of seagrass plants that were present in canal entrances took place over time. Seagrass species tolerant of higher nutrient conditions tended to disappear and were replaced by those that grow well in lower nutrient conditions. This shift toward fewer nutrient-loving plants indicates a reduction in nutrient concentrations in canal waters. Similar analyses are also being done throughout the sanctuary to track shifts that indicate changes in nutrient concentrations and seagrass growth (http://ocean.floridamarine.org/fknms_wqpp/pages/special_projects.html).

Research studies have helped identify the contribution of nutrients and other pollutants from sources originating outside of the Keys themselves from far-field sources beyond sanctuary boundaries. Water quality studies show that nutrient enriched waters are reaching the Keys from land-based sources that are upstream of the Keys (see Gulf of Mexico section).

Sponge Research: Sponges are important components of coral reefs and bay communities. Besides filtering seawater through their bodies to obtain food and oxygen, sponges serve as shelter and habitat for a variety of organisms, including juvenile spiny lobster. In the section dealing with hardbottom communities, the sanctuary's Comprehensive Science Plan, 2002, describes the need managers have for more information on the ecological significance of commercial sponge species. Research is needed that quantifies the habitat value of commercial sponges to marine life and assesses the impacts of the commercial sponge fishery on hardbottom habitat.

Over the years, sponge biology and ecology have been the focus of studies conducted by scientists from various academic institutions, including the University of North Carolina at Wilmington (UNCW) (<http://people.uncw.edu/pawlikj/xmuta.html>), University of Florida (<http://www.behringerlab.com/index.html>), and Florida International University (http://serc.fiu.edu/wqmnetwork/boyerj/reports/GWHR_FINAL_2005.pdf). From these studies, scientists have learned about the filtering rates of certain sponges and how water characteristics can be changed by passing through the sponge tissue. Certain sponges (*Cliona spp.*) are known to bio-erode the skeletons of stony corals; therefore, changes in their distributions over time might affect stony coral species. Because of their presence at the reef and their ecological role, the distributions of Clionid sponges and other sponges have been recorded as part of regular surveys conducted to document reef life in the Keys (<http://www.poriferabrasil.mn.ufrj.br/iss/>, http://ocean.floridamarine.org/fknms_wqpp/pages/cremp.html). The exact role that sponges play in water quality in reef ecosystems and in Florida Bay has not been fully studied.

Future Actions

NOAA will continue to work with its federal, state and local partners to support the WQPP monitoring and research program and implement management actions based on scientific information gained from these studies. NOAA has provided guidance and financial and in kind support for many water quality and resource focused studies and will continue to serve in this role to further knowledge about managing sanctuary resources under changing conditions. The sanctuary will continue to implement its comprehensive science plan with its science partners in government, academia, and non-governmental agencies in order to make informed decisions. The factors affecting corals and coral reefs are complex, but improvements in water quality resulting from wastewater and stormwater management actions are expected to reduce stressors to near shore corals and other marine life.

2. Water Quality Targets and Criteria

Several commenters noted that the sanctuary's Water Quality Action Plan (FKNMS Management Plan, 2007) called for the development of water quality standards appropriate to sanctuary resources, including the need to outline specific nutrient and other pollutant goals and criteria that will protect and restore all Sanctuary resources. One commenter urged the sanctuary to develop a meaningful water quality restoration plan to reverse existing declining trends. Several commenters attributed declines in resource conditions to poor water quality. Commenters agreed that criteria or standards should be developed using the best available

science and methods. One commenter stated that nutrient levels of coral reef ecosystems need to be maintained at far lower levels than for other marine ecosystems.

Other comments were received expressing concerns about FDEP's numeric nutrient criteria for sanctuary waters; standards are being based on maintaining current healthy conditions and it was asserted that current conditions are not "healthy" for the resources. According to the commenter, FDEP proposed standards are not low enough to meet the nitrogen, phosphorus and chlorophyll levels that existed in the 1980s on offshore bank reef conditions. The intention of the 1985 designation of Keys waters as "Outstanding Florida Waters" was to protect water quality from any further degradation. Another commenter stated that the dissolved inorganic nitrogen and soluble reactive phosphorus concentrations need to be decreased to 1980 levels when natural resources were in "good" condition.

Current Actions

Reasonable Assurance Plan and Nutrient Targets: The Florida Keys Reasonable Assurance Plan (RAP) provides a detailed overview of all wastewater and stormwater management actions designed to reduce nutrient inputs from local land-based sources that are currently underway or are planned (<http://www.dep.state.fl.us/water/watersheds/rap.htm>). Detailed analyses conducted as part of the RAP showed that implementation of the plan is expected to virtually eliminate nutrient inputs from wastewater and stormwater by 2020. Florida's 1998 Impaired Waters List identifies waters of the Florida Keys as impaired for nutrients. The RAP, which was adopted by EPA in 2012, was developed through a coordinated effort led by FDEP to satisfy the requirements associated with this Impaired Waters Rule.

The RAP provides two sets of nutrient targets for TN and TP that apply in near shore waters. One of the two targets was set based on the 1985 Outstanding Florida Waters (OFW) designation data and requires that nutrient concentrations average less than ambient conditions measured at the time of the designation (<http://www.dep.state.fl.us/water/wqssp/ofw.htm>). Another target sets a limit that is an insignificant increase above background water quality conditions. This approach of having two sets of targets is one that protects water quality and reduces local sources of nutrient pollution, but does not penalize local governments for nutrients inputs that originate outside of sanctuary boundaries (far-field sources), (<http://www.dep.state.fl.us/water/watersheds/rap.htm>), (see Gulf of Mexico and Everglades/Florida Bay sections).

The OFW designation for the Florida Keys was established under state statute and has served to protect the waters of the Florida Keys and other water bodies that are recognized as deserving of special protections in terms of water quality because of their exceptional ecological and recreational significance (Ch. 62-302.700, F.A.C). This designation requires that new discharges meet the following criteria: new direct point source discharges must not lower existing ambient water quality; new indirect pollutant discharges (discharges to waters that influence OFWs) must not significantly degrade adjacent OFWs; and activities or discharges in an OFW that receive a FDEP or a Water Management District (WMD) permit must be "clearly in the public interest."

Clean Water Act Water Quality Standards—Numeric Criteria: In 2009, in accordance with the Clean Water Act, EPA determined that numeric nutrient criteria were needed to reduce nutrient pollution, which causes algae blooms in Florida’s waters. To respond to this requirement, FDEP developed numeric nutrient criteria for water quality in five different subbasins the Florida Keys (<http://www.dep.state.fl.us/water/wqssp/nutrients/estuarine.htm>). EPA approved these criteria on November 30, 2012. Long-term monitoring data have shown that one set of numeric nutrient criteria would not have been appropriate for the entire range of conditions that exist across the Keys and supported the need for separate criteria for each of the subbasins--ocean, bay, backcountry, Marquesas, Dry Tortugas (http://water.epa.gov/lawsregs/rulesregs/florida_coastal.cfm). Numeric criteria include a long-term limit and an upper limit for TN, TP and Chlorophyll-a. At the same time, EPA adopted numeric nutrient criteria for Florida and Biscayne Bays—two estuaries that are adjacent to the Florida Keys.

WQPP EPA Strategic Targets: EPA has also developed a set of strategic targets based on WQPP water quality monitoring data collected between 1995 and 2005. Targets for chlorophyll-a and light attenuation were established for all reef sampling sites. Chlorophyll-a measures the amount of living plant material in the water column (micro-algae), with the target set at less than or equal to .35 micro-grams per liter. Light attenuation is the degree of light transmitted through water. The light attenuation target is set at less than or equal to 0.20 per meter. Targets for all sampling sites in the sanctuary include Dissolved Inorganic Nitrogen (DIN) and TP and are set at less than or equal to .75 micromolar and less than or equal to .25 micromolar, respectively. A table showing how the field measurements compare to the strategic standards is produced each year in the Water Quality Monitoring Program Annual Report (http://ocean.floridamarine.org/fknms_wqpp/pages/wqmp.html), issued by Florida International University.

Future Actions

FDEP and EPA will continue to implement the numeric nutrient standards that are in place for the Florida Keys, Florida Bay and Biscayne Bay. Additionally, WQPP water quality monitoring of stations throughout the Florida Keys National Marine Sanctuary is expected to continue to provide the data needed to compare the conditions measured annually with the EPA strategic targets for chlorophyll-a, light attenuation, DIN and TP.

3. Sewage Treatment and Stormwater Runoff

Poor water quality was identified by some commenters as the primary cause of ecosystem degradation. Nutrients from wastewater contamination and stormwater runoff are identified as having had a negative impact on water quality and the coral reef ecosystem. Some commenters noted the need for better sewage treatment in the Keys, while others were aware that wastewater upgrades are taking (and have taken) place in the Keys. One commenter disapproved of Marathon’s wastewater system’s treatment process and grey water/effluent disposal methods and another disapproved of Key West’s stormwater management practices, partially because practices interfere with breeding frogs and create unsafe swimming conditions.

Current Actions

Wastewater Improvements: When the sanctuary was designated in 1990, 19 facilities were actively discharging effluent directly into near shore waters, including water treatment plants, power plants, a desalination plant, and other industrial facilities (<http://floridakeys.noaa.gov/scipublications/condition.html>). Research generated by the Water Quality Protection Program (WQPP) helped identify water quality concerns in the sanctuary and those concerns were addressed when state lawmakers enacted a law requiring disposal systems in Monroe County to comply with new stringent effluent standards by July 1, 2010. In addition, new surface water discharges of wastewater were prohibited, and existing surface water discharges had to be eliminated by July 1, 2006. In 2010, the Florida Legislature extended the July 1, 2010 wastewater compliance deadline to December 31, 2015, and the associated treatment and disposal requirements are now incorporated in Section 403.086(10), Florida Statutes.

Today, Monroe County and local municipalities are undergoing (and have undergone) extensive upgrades in wastewater infrastructure to meet requirements designed to reduce nutrient loadings from land and achieve the water quality targets. Wastewater upgrades include closing down old plants and requiring new plants to use deepwell injection or shallow water injection instead of near shore outfalls. All residences and businesses in the Florida Keys will be connected to central sewer or use Best Available Technologies (in remote areas) by January 1, 2016. As of mid-2013, approximately 70% of all sewer connections in the Keys have been made.

When these management actions are complete, baseline wastewater nutrient loads originating in the Keys will be virtually eliminated in near shore waters and a significant effort in removing anthropogenic stormwater will have been made. The details of these upgrades, which meet Clean Water Act requirements, are provided in a Reasonable Assurance Plan (RAP) for the Florida Keys (<http://www.dep.state.fl.us/water/watersheds/rap.htm>). The RAP (which is described in five RADs) estimates that by 2020 when all management actions have taken place throughout the Keys, the loading of Total Nitrogen will be reduced by 63% and the loading of Total Phosphorus will be reduced by 73%.

Wastewater infrastructure improvements are being carried out by local jurisdictions throughout the Keys and are at various stages of completion. The City of Key West has been operating with a wastewater system that meets Advanced Wastewater Treatment Standards (AWT) since the early 2000s (<http://www.keywestcity.com/department/division.php?structureid=164>). With AWT and the replacement of the central outfall with deepwell injection, the city has essentially completed its wastewater upgrades in accordance with the Southern Keys RAD. The City of Marathon is being served by five separate city owned and operated central wastewater systems <http://www.ci.marathon.fl.us/government/utilities/wastewater-utility>. Marathon's AWT system removes nearly all nutrients from effluent waters, which discharge to shallow effluent disposal wells in compliance with Florida state law and the Clean Water Act. Wastewater projects in the Key Largo Wastewater Treatment District (KLWTD) are also nearing completion. The KLWTD currently uses a central wastewater collection system and an AWT facility with deep injection well for effluent disposal <http://www.klwtd.com>.

In 2012 the Florida Legislature and the Governor approved \$50 million dollars in bonds for wastewater projects in Monroe County. These funds are being used to jump start the construction of the Cudjoe Key Regional facility (<http://cudjoewastewater.com>), which will serve the Lower Keys (except Key West); and the Village of Islamorada Wastewater System, which will serve Islamorada in the Upper Keys (www.islamorada.fl.us). Both projects had stalled in recent years because of lack of funding.

Stormwater Upgrades: Stormwater runoff from developed areas enters canals and near shore waters during rainfall events and contributes to nutrient pollution. Throughout the Keys, many improvements in treating stormwater have already taken place (and are planned) by local municipalities and unincorporated Monroe County in conjunction with Florida Department of Transportation (FDOT). Stormwater upgrades include actions such as retrofitting existing storm drains, street litter management and a host of other actions also designed to reduce street flooding. These management actions represent a significant effort in removing the baseline stormwater nutrient load attributed to human-induced sources. Such improvements are necessary to meet state requirements and to obtain Environmental Resource Permits (ERPs) needed when existing facilities are upgraded or new ones are constructed. Details for stormwater upgrades may be found in the RADs and in the City of Key West 2012 Stormwater Master Plan (<http://www.keywestcity.com/departments/division.php?structureid=162>).

Future Actions

In accordance with state law and the RAP, Monroe County, the Cities of Marathon and Key West and other municipalities and unincorporated areas will continue to implement upgrades to wastewater and stormwater treatment and maintain existing upgraded systems. In doing so, nutrient inputs to near shore waters will be significantly reduced and the result will be improved water quality. Algae blooms associated with Keys land-based sources are expected to occur less often. Regular updates on the progress made will continue to be provided to the sanctuary's WQPP. Regulatory agencies, FDEP and EPA, will oversee these upgrades and monitor their effectiveness through a suite of measures that are described in the RAP.

Additional Information

Learn About Your Watershed/Water Resource Agencies

http://www.protectingourwater.org/watersheds/map/florida_keys/

4. Canal Restoration

Concerns were expressed about water quality in local canals. Some commenters stated NOAA should develop methods to improve canal water quality. Another commenter noted that water flows and dissolved oxygen would be improved by opening up areas where canals (and roads) interfere with circulation.

Current Actions

Monroe County Canal Master Plan: Water quality in many of the 502 residential canal systems of the Florida Keys has been negatively affected by a combination of factors. Water circulation is often poor due to the structure and geometry of canals and untreated wastewater from septic systems (<http://floridakeys.noaa.gov/scipublications/condition.html>) that has seeped through the porous limestone rock. Poor circulation and nutrient inputs from wastewater, floating weed wrack and other sources have led to micro-algal blooms and low dissolved oxygen conditions and the buildup of sediments on canal bottoms. Accumulated sediments contain organic matter and chemicals and are often anaerobic. For these reasons, many residential canals in Monroe County do not meet the State's minimum water quality criteria and are a potential source of nutrients and other contaminants to near shore waters of the sanctuary. An important first step to clean up canals has been taken with the implementation of improved wastewater treatment throughout the Keys, but this will not address all canal water quality issues. Structural changes to depth and flow patterns are necessary to increase circulation and dissolved oxygen levels and to prevent the accumulation of organic debris.

The WQPP formed a Canal Restoration Advisory Subcommittee in 2012 to help guide the canal restoration process. The subcommittee consists of representatives from municipalities and agency experts in water quality and holds regular publically noticed meetings. In 2013, Monroe County, in conjunction with the engineering firm AMEC, completed the first phase of a Canal Management Master Plan (CMMP). Phase 1 of the CMMP, which involved completing a bathymetric survey on canals and analyzing bottom sediments from selected sites for physical and chemical characteristics, was funded by FDEP. Depth and other bathymetric data were collected on 482 canals out of 502 and entered into a GIS database. Twenty canals were not surveyed because the survey boat could not access them.

Phase 2 of the CMMP, funded by EPA, developed a conceptual framework for canal restoration and management, prioritized canals using a ranking system and provided recommendations on feasible strategies to improve water quality. Updates from the canal restoration subcommittee are provided to the WQPP steering committee at its biannual public meetings (http://ocean.floridamarine.org/fknms_wqpp/pages/wqpp.html). Plan and project updates and Canal Restoration Advisory Subcommittee meeting minutes and notifications are available on Monroe County's canal restoration home page (<http://www.monroecounty-fl.gov/index.aspx?NID=598>).

Canal Restoration Technologies and Demonstration Projects: AMEC engineering firm is currently conducting canal demonstration projects that test different restoration technologies on selected Keys canals. These demonstration projects, funded by Monroe County's unincorporated infrastructure tax, are expected to provide much needed information to develop realistic future plans and funding scenarios. The technologies being tested and evaluated include the following: weed barriers/air curtains, organic material removal, adding culverts, back-filling, and pumping. To help evaluate the effectiveness of the restoration technologies, monitoring of water quality, seagrass cover and marine life is underway in restoration canals. Monroe County is working with canal residents to keep them informed and has developed a canal homeowner questionnaire that collects information on canal conditions and homeowner associations (<http://fl-monroecounty.civicplus.com/DocumentCenter/View/5759>).

Future Actions

The upgrades in wastewater and stormwater treatment made in recent years in Monroe County are expected to improve conditions in canals by reducing nutrient inputs. In some canals structural changes and other methodologies will also be needed to bring about improvements in dissolved oxygen levels and other water quality characteristics. As the Canal Management Master Plan is implemented, structural issues are expected to be identified and corrected using appropriate restoration technologies. Monroe County and local municipalities are committed to improving water quality conditions in Keys canals and will continue working closely with the sanctuary, EPA, FDEP and other partners on the Water Quality Protection Program's Canal Restoration Advisory Subcommittee to seek funding and implement measures designed to improve canal water quality.

5. Mooring fields/Liveboards/Pumpouts

Many commenters support implementing more managed mooring fields for all liveboards and restrictions that prohibit living outside of managed moorings. Mooring fields should be placed where minimal damage is done to natural resources, be appropriate for the size of the vessel and have pumpout and land facilities. Several commenters urged the sanctuary to address liveboards in its zoning and regulatory review. Commenters also requested that more pumpout facilities be available in the Keys and that they be readily accessible for both commercial and recreational vessels. Suggestions were made to implement incentives for pumping out and to better enforce pumpout regulations.

Current Actions

Florida Fish and Wildlife Conservation Commission (FWC) Pilot Program for Anchoring and Mooring: Monroe County, in partnership with the Cities of Key West and Marathon, is currently participating in the FWC Pilot Program for Anchoring and Mooring, which is intended to promote public access to the waters of this state, enhance navigational safety, protect the marine environment and deter abandoned or derelict vessels (<http://fl-monroecounty.civicplus.com/index.aspx?NID=428>). FWC was directed by Florida Statute 327.4105 to establish this pilot program to test policies and regulatory regimes that promote the establishment and use of public mooring fields (<http://myfwc.com/boating/anchoring-mooring>). As part of the pilot program, Monroe County implemented an anchoring and mooring ordinance in 2012 (Ord.No.036-2012) (<http://www.monroecounty-fl.gov/DocumentCenter/Home/View/4039>). The ordinance established four 'managed anchoring zones' (in previously unmanaged anchorages) with regulations that apply to the respective managed anchoring zones in the Cities of Key West and Marathon. Anchored vessels within these zones are required to provide proof of pumpout and must be maintained so as to not exhibit "pre-derelict conditions". Enforcement of pilot program regulations is being carried out by FWC's Division of Law Enforcement. Provisions include fines and possible removal of the offending vessel from the managed anchorage. The results of the pilot program, which began in 2010, were evaluated by the FWC and a report was submitted

in 2013 to the Governor and Legislature with the findings and recommendations. In 2014, the FWC Pilot Program was extended and is now scheduled to expire on July 1, 2017.

Marine Sanitation Device Regulation: The sanctuary's marine sanitation device (MSD) discharge regulation, implemented in 2010, prohibits the discharge of vessel sewage from marine sanitation devices (MSDs) and requires MSDs to be locked while in sanctuary waters. Enforcement of the MSD regulation is carried out by FWC and the US Coast Guard. Each agency conducts inspections of vessels on the water and while at port.

Pumpout facilities are currently located at both private and public marinas/facilities throughout the Keys. Many of these facilities received FDEP Clean Vessel Act grant funds for start-up costs. Pump-out locations are listed on FDEP's Clean Marina and Clean Boatyard program website (<http://www.dep.state.fl.us/cleanmarina/>) and in the FWC Boater Guides (<http://research.myfwc.com/products/products.asp>). A one-page flier produced and distributed by the sanctuary also explains the sanctuary's MSD discharge rule and provides pumpout location information (<http://floridakeys.noaa.gov/regs/MSDRuleInformation.pdf>). Commercial vessels may use pumpout facilities at Bahia Honda and John Pennekamp Coral Reef State Parks at no charge or contact a commercial vendor for services.

Mobile pumpout boats also serve the Florida Keys boating community. Currently, six pumpout vessels located throughout the Keys help ensure the proper disposal of boater sewage. In 2013, FDEP awarded more than \$539,000 in Clean Vessel Act grant funds to provide no-cost mobile boater pumpout services to recreational boaters and liveaboards in unincorporated areas of the Keys. Monroe County contributed \$329,000 dollars to support the mobile service and has supported pumpout vessel operations since 2005.

Clean Marina, Clean Boatyard and Clean Boater Programs: Since 2000, FDEP has encouraged clean boating through the development of the Clean Marina and Clean Boatyard Programs, supported with funding from the Clean Vessel Act. These voluntary programs take a proactive approach to environmental stewardship and require that participants employ Best Management Practices (BMPs) designed to protect the environment. Nineteen marinas in the Florida Keys are recognized as Clean Marinas and use BMPs to address waste management, stormwater control, spill prevention and emergency preparedness. One boatyard (Marathon Boatyard) in the Keys has been recognized as a Clean Boatyard (<http://www.dep.state.fl.us/cleanmarina/boatyard/default.htm>). Clean Boatyards use dustless sanders and employ oil and solvent recycling and re-circulating pressure wash systems to recycle wastewater. Boaters can opt to support Clean Marinas and Clean Boatyards to better protect sanctuary water quality. They can also adopt pollution measures while on their personal boat and become a Clean Boater (<http://www.dep.state.fl.us/cleanmarina/boater/default.htm>).

Future Actions

The outcome of continued research conducted on the effectiveness of the FWC Pilot Anchoring and Mooring Program will be presented to the state legislature by FWC for consideration in 2017. Florida's state legislators may implement a more permanent law that would pertain to local governments' authority to regulate anchoring and mooring. Efforts to educate boaters on sanctuary regulations related to anchoring and pumpouts/marine sanitation devices will continue.

Many pumpouts are privately owned. Marinas and other facilities can opt to provide this service for a fee and may apply for grant funds to establish a pumpout station. In the near future, when all marinas and facilities in the Keys are connected to the high level of sewage treatment required by state law, more facilities may be better equipped to offer pumpout services to boaters, making it easier for boaters and commercial vessels owners to use them. FDEP and the sanctuary will continue to help educate residents about the Clean Marina, Clean Boater and Clean Boatyard programs. Voluntary participation in these programs promotes best management practices on and near sanctuary waters.

6. Safe Beaches: Several comments identified comments regarding water quality in waters off of Key West beaches. One commenter noted that even though sewage treatment has been in place in Key West for several years, the city's beaches still show high bacteria levels at times. Another commenter noted the same thing and wanted NOAA to investigate the source of high bacteria levels. One comment was received objecting to having street runoff flow directly into the ocean as it does in Key West because it can pollute near shore waters and cause unhealthy conditions for swimmers.

Current Actions

Florida Healthy Beaches Program: As part of the Florida Healthy Beaches Program, the Florida Department of Health (FDOH) has been collaborating with local agency partners to monitor beach water quality in the Florida Keys since 2000 (http://www.myfloridaeh.com/beach_sampling/dpCounty_Beaches_MashUp7.html). This program, which samples beach waters every two weeks, detects the presence of human bacteria that could cause disease, infections, or rashes and issues a "swimming advisory" when bacteria reach a certain level. The cause of each advisory is not usually known, but the passage of new state legislation in the summer of 2009 requires the FDEP to investigate public waste water treatment facilities within one mile of a beach that has had an advisory issued. There are currently 17 beaches tested in Monroe County, five of which are within the city of Key West.

Stormwater Management: High bacteria levels in beach waters can also be due to stormwater runoff, which contains waste from animals. Heavy rains can also cause increased runoff and overload stormwater systems. The City of Key West 2012 Stormwater Master Plan has been developed to prevent flooding, divert stormwater flow from outfalls, and reduce/eliminate discharge of pollutants and contamination of near shore waters. Implementation of the master plan is currently underway. When complete, the system will include five pump-assist injection wells, the installation of injection wells, the retrofitting of existing injection wells and the elimination and/or retrofitting of 63 outfalls. This upgraded system, required by the Clean Water Act, is expected to continue to improve the quality of near shore waters in and around Key West. Other stormwater management actions are also being taken throughout the Keys to reduce nutrient inputs from stormwater runoff (see Sewage and stormwater section and RAP (<http://www.dep.state.fl.us/water/watersheds/rap.htm>)).

Future Actions

The Florida Healthy Beaches Program will continue to monitor Florida's beaches in conjunction with participating local municipalities and state parks and as required by law, investigate when standards are exceeded in the vicinity of public wastewater facilities. The City of Key West, other municipalities and unincorporated areas of Monroe County will continue to improve stormwater management in accordance with the Reasonable Assurance Plan (RAP). If these and other related actions do not result in consistently better conditions at local beaches, further research into causes of degradation may be warranted and could be conducted by FDEP, other agencies or academic institutions.

7. Oceanic / Marine vessel discharges

Comments were received about the impacts to marine resources when cruise ships and other large vessels discharge untreated human waste, plastic trash and garbage and bilge oil in the vicinity of the sanctuary. It was noted that the current distance limits from shore for vessels dumping garbage and waste are not adequate to prevent impacts to sanctuary marine life and water quality. Commenters support strong enforcement of all no-discharging regulations. Another commenter stated that the No-Discharge rule (specifically Ships Reg.5531) is unmanageable for large ships.

Current Actions

Marine Sanitation Device Regulations: Cruise ships and other large vessels operating in sanctuary waters are required to adhere to all sanctuary regulations, including prohibitions on discharging oily bilge water, garbage and other materials. The sanctuary's MSD (marine sanitation device) regulation prohibits any vessel from discharging sewage (treated or untreated) into sanctuary waters and requires that MSDs be locked while in sanctuary waters. In addition, vessels greater than 164 feet (50 meters) in length can only transit through the sanctuary in the deeper channels and waters inside the sanctuary's Area To Be Avoided. The US Coast Guard (USCG) and FWC officers enforce sanctuary regulations. The USCG also enforces federal laws in US Territorial waters, which lie within 12 miles of shore (http://www.gc.noaa.gov/gcil_seaward.html).

Vessels operating outside of sanctuary waters (but still in US waters) are subject to federal laws. All US flagged passenger vessels with an installed toilet must have and use an approved MSD for sewage. Under the Clean Water Act, vessel sewage is controlled by regulating the types of MSDs and through the establishment of areas in which discharge is not allowed (No Discharge Zones). In 2002, EPA and the state of Florida made state waters of the sanctuary a No Discharge Zone and in 2010 federal regulations implemented by the sanctuary prohibited the discharge of vessel sewage for all waters in the sanctuary. The USCG conducts vessel inspections and is responsible for verifying that a vessel has a certified sewage system in good and serviceable condition (<http://water.epa.gov/polwaste/vwd>).
http://www.imo.org/blast/mainframe.asp?topic_id=237).

Vessel Discharges and Vessel General Permits: Vessel discharges (other than sewage) for commercial vessels greater than 65 feet in length are regulated through a Vessel General Permit (VGP) issued by EPA. This permit regulates 26 specific discharge categories and numeric ballast water discharges for most vessels. The VGP aligns with the USCG ballast water rulemaking (http://cfpub.epa.gov/npdes/home.cfm?program_id=350). Cruise ships and other vessels that discharge a combined stream of graywater and sewage are required to obtain a VGP and must treat that effluent according to EPA standards. According to the Cruise Lines International Association, Inc. (CLIA), many cruise ship lines are at various stages of employing a very high level of treatment (Advanced Wastewater Treatment) on board their ships. (<http://www.cruising.org/regulatory/issues-facts/environment/wastewater-management>).

Ocean Dumping Act: The Marine Protection, Research, and Sanctuaries Act of 1972, also known as the ocean dumping act, is a federal law that regulates the dumping of wastes such as industrial waste, sewage sludge, biological agents, radioactive agents, garbage and chemicals. The act is administered by the EPA and enforced by the USCG (<http://www2.epa.gov/laws-regulations/summary-marine-protection-research-and-sanctuaries-act>).

MARPOL and Act to Prevent Pollution from Ships (APPS) : In international waters, oil pollution, harmful chemicals, sewage and garbage are regulated by the International Convention for the Prevention of Pollution from Ships, MARPOL (<http://www.imo.org/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL>). MARPOL has been adopted by most countries through the International Maritime Organization (IMO).

In US waters, the Act to Prevent Pollution from Ships (APPS, 33 U.S.C. §§1905-1915), is a federal law that implements MARPOL and is enforced by the USCG. Ships of U.S. registry or are under the authority of the U.S. (with a few exceptions) are subject to the APPS discharge provisions worldwide. Foreign-flagged vessels operating within U.S. jurisdictional waters, which include its ports or terminals, internal waters, territorial sea, and the exclusive economic zone are also subject to APPS (http://www.gc.noaa.gov/gcil_seaward.html#apps). MARPOL and APPS contain provisions that help prevent oil pollution generated from ship operations as well as from accidental discharges. Other provisions regulate the disposal of ballast water and bilge water. Not all discharges are prohibited under MARPOL, but restrictions are often imposed and pollution prevention measures and recordkeeping of disposal and treatment practices are required for many discharges.

Annex IV of MARPOL regulates the discharge of sewage into the sea and other aspects of disposal and treatment of vessel sewage. Annex IV was revised in recent years and now requires that all large ships (over 400 gross tonnages) be equipped with either a sewage treatment plant or a sewage comminuting and disinfecting system or sewage holding tank. In areas where no other restrictions exist, ships can discharge comminuted and disinfected sewage beyond 3 nautical miles and untreated sewage beyond 12 nautical miles. In 2006, new guidelines for effluent standards and performance test for treatment plants installed after 2010 went into effect. At the same time, a new standard that controls the maximum rate at which the discharge of untreated sewage can take place was implemented (in waters beyond 12 miles).

MARPOL and APPS also contain provisions that prevent the dumping of all plastics. In 2013, new stricter garbage discharge regulations were implemented by the USCG through the federal rule-making process in response to revisions made in MARPOL Annex V by the International Maritime Organization (IMO) in 2011. Violators of MARPOL and/or APPS are subject to fines and may be required to develop a strict environmental compliance. Crew members involved in violations are subject to incarceration.

Even with regulations in place, cruise ships and other large vessels are known to generate pollution in the form of bilge water, blackwater (sewage), graywater (waste from showers, sinks, laundries, and kitchens), ballast water, and solid waste (food waste and garbage) in waters outside of the sanctuary. Ocean currents have the potential to transport these pollutants into sanctuary waters (<http://floridakeys.noaa.gov/scipublications/condition.html>). EPA produced a 2008 white paper that describes some preliminary background information and recommendations regarding EPA's assessment of cruise ship discharges (http://water.epa.gov/polwaste/vwd/cruise_ship_disch_assess.cfm).

Sanctuary Advisory Council Large Vessel Working Group: Most large vessels enter sanctuary waters in the vicinity of Key West using deepwater channels. In 2003, the Florida Keys Sanctuary Advisory Council formed a Large Vessel Working Group that was tasked with investigating the impacts of cruise ships on sanctuary resources. The working group (now disbanded because earlier issues have been addressed) worked closely with the cruise ship industry and ultimately agreed to support the City of Key West's effort to develop fair and effective environmental practices for large ships. The working group also supported the expansion of the MSD regulation into all sanctuary waters for all vessels (<http://floridakeys.noaa.gov/scipublications/condition.html>).

Future Actions

NOAA supports the strict enforcement by USCG and FWC of all sanctuary regulations and of all environmental federal laws that pertain to discharges from ships. EPA and the USCG will continue to jointly enforce the VGPs requirements for large vessels. The Department of Justice, in conjunction with USCG, will continue to prosecute MARPOL/APPS violators and impose strict penalties and environmental corrective measures. The APPS makes provisions for whistleblowers and many federal cases have been prosecuted using evidence provided by whistleblowers. The IMO is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships and is governed by an Assembly and Council. The IMO is a technical organization and most of its work is carried out in a number of committees and subcommittees. The Marine Environment Protection Committee was established in 1973 and was responsible for adopting the new stricter sewage standards that went into effect in 2010. The IMO is expected to continue to address safety and pollution issues in international waters, including those in the vicinity of the sanctuary.

Regulatory Alternative to be included in the Draft Environmental Impact Statement

Evaluate the economic and environmental benefit/impact of implementing a regulation of gray-water discharges from cruise ships similar to other National Marine Sanctuaries.

8. Law Enforcement

Several commenters identified the need for increased enforcement of sanctuary water quality regulations on land and at sea, especially the no sewage discharge regulation. They also called for increased enforcement of moored vessels because they are creating an environmental hazard and navigational issues. One commenter would like to see NOAA and USFWS find the funding to hire more law enforcement officers and to clean up sanctuary waters. Comments were made supporting the proposal of new regulations that specifically cover derelict vessels and littering because each issue is significant enough to warrant an individual sanctuary regulation. Enforcement of environmental regulations was a theme that appeared in comments regarding cruise ships and other large vessels, marine debris, pumpouts, moored vessels, and the monitoring and enforcement of water quality standards.

Current Actions

FWC, USCG and other Enforcement Agencies: An enforcement presence in sanctuary waters is necessary in order to protect and conserve resources. Enforcement of marine regulations is conducted through a variety of mechanisms including the USCG, USFWS, NOAA's Office of Law Enforcement, National Park Service, FWC's Division of Law Enforcement and county and other local enforcement entities. In general, FWC officers conduct most of the on-the-water enforcement of sanctuary regulations and state boating, fishing and marine safety regulations. This includes regulations that apply to anchoring, pumpouts, littering, navigation and enforcement of state water quality standards in conjunction with FDEP (<http://myfwc.com/law>).

The USCG operates three stations with nearly 600 personnel in the Florida Keys and is responsible for law enforcement, marine environmental protection, marine safety, search and rescue and maintaining navigational aids (Department of Homeland Security) (<http://www.uscg.mil/d7/sectKeyWest>, <http://www.uscg.mil/hq/cg5/cg531>). The USCG, in conjunction with EPA, enforces regulations associated with the Clean Water Act, and, along with FWC, inspects MSDs (<http://www.epa.gov/Compliance/civil/cwa/index.html>). The Coast Guard Auxiliary has approximately 300 volunteers who patrol sanctuary waters on a regular basis and call law enforcement when needed. Auxiliary volunteers are trained to respond to incidents reported by the public such as small oil spills and help educate the public about sanctuary regulations, including the marine sanitation device discharge regulation (<http://a07013.uscgaux.info>).

Future Actions

Enforcement of sanctuary regulations, including seeking funding to support better compliance, will continue to be a top priority for the sanctuary. In recent years the sanctuary has strengthened its relationship with the USCG and Coast Guard Auxiliary in an effort to better patrol sanctuary waters. The sanctuary will continue to work with the Auxiliary and its law enforcement partners, the USCG, USFWS, NPS and FWC to improve enforcement of measures that protect marine life and water quality. The sanctuary will continue to communicate to the USCG and other federal partners the need for strong enforcement of environmental regulations

for vessels operating in federal waters in the vicinity of the sanctuary to better protect sanctuary resources from impacts of violations.

9. Everglades Restoration and Florida Bay

Concerns were expressed about negative impacts of Florida Bay waters and agricultural runoff from the Florida mainland on sanctuary coral reefs and water quality. One commenter attributed nutrient-enriched runoff from upstream as a factor causing sanctuary waters to have constant micro- and macro-algae blooms. Commenters indicated FKNMS should take a firmer stance against agricultural runoff and water quality conditions would improve with better enforcement by EPA of the water quality standards in accordance with the Clean Water Act. Water quality could also be improved by implementing, enforcing and monitoring restrictions preventing agricultural contaminants from entering the system from elsewhere. One commenter advocated for restoration of freshwater flows into eastern Florida Bay.

Current Actions

Micro-organism Blooms in Florida Bay: Environmental conditions created by micro-organisms that experience blooms are detrimental to coral reef growth and development. Widespread blooms and the sudden mortality of thousands of acres of seagrass were first observed in northeastern/central Florida Bay in the late 1980s to early 1990s. Under certain tidal conditions blooms were carried to the ocean side of the Keys and created environmental conditions that were not favorable for coral growth and development. Studies launched to investigate the cause of these blooms showed that nutrients needed to fuel blooms of the “blue-green” micro-organism (cyanobacterium) had come from decaying seagrass and organic matter accumulated in Florida Bay during many years of low hurricane activity and reduced inflows of freshwater from the mainland wetlands. This blue-green micro-organism “bloomed” or flourished under these unusual environmental conditions and outcompeted most other micro-organisms (<http://floridakeys.noaa.gov/scipublications/condition.html>).

Everglades/Florida Bay Restoration: Freshwater flows were reduced into the bay as wetlands were drained by an extensive levee- canal system built on the mainland to create dry land for human habitation. To address these and other issues created by the draining Everglades wetlands, restoration projects are underway on the mainland. Some projects have been completed and may have already improved water quality conditions in one portion of Florida Bay by increasing freshwater flows through Taylor Slough on the mainland in Everglades National Park.

Since Florida Bay lies within Everglades National Park, park managers are working very closely with other agencies and the South Florida Ecosystem Restoration Task Force (SFERTF) to implement restoration and manage the ecosystem using an adaptive management approach that makes changes in water operations in response to the state of natural resources downstream (<http://www.sfrestore.org>). The sanctuary and its NOAA partners also participate in the SFERTF to track the results of restoration projects and provide feedback on sanctuary resources as needed. Everglades National Park is represented on the steering committee of the WQPP and this provides opportunities for additional communication on water quality related issues.

The Comprehensive Everglades Restoration Plan (CERP) was the first major project led by the Army Corps of Engineers and its federal and state agency partners (<http://evergladesplan.org>). CERP projects were designed to re-plumb the existing canal system with the goal of rehydrating Everglades wetlands and improving flows of high quality fresh waters to coastal estuaries, including Florida Bay. Several CERP projects are focused on restoring the Caloosahatchee River on Florida's southwest coast, which is rich in agricultural nutrients that reach the Keys when waters flow southward along Florida's southwest coast (http://www.evergladesplan.org/pm/projects/project_list.aspx). These projects are collectively designed to improve water quality throughout the system, including the Caloosahatchee River. All "new" water brought into the system for restoration purposes is required to meet phosphorus standards set by EPA prior to being discharged into Everglades wetlands or coastal waters.

The Central Everglades Planning Project (CEPP) is the newest restoration effort. CEPP is a collection of projects that are designed to increase freshwater flows through wetlands feeding into Florida Bay. Increased flows will rehydrate the bay and create more natural estuarine conditions that will favor more natural (and desirable) populations of micro-organisms in the water column (<http://www.sfrestore.org/cepp/cepp.html>). Rehydrating the bay is expected to improve estuarine conditions in eastern Florida Bay in time.

Water Quality Monitoring and Micro-Algae Bloom Detection: Currently, water quality sampling is conducted in Florida Bay through the South Florida Water Management District. Water sampling and monitoring of sanctuary waters is conducted by Florida International University (FIU) and the Southeast Research Center Water Quality Monitoring Network (<http://serc.fiu.edu/wqmnetwork>) under the WQPP. Study results show that the most intense micro-algae blooms (highest chlorophyll-a values) are found in waters outside of the sanctuary off of Florida's Southwest Shelf in the Gulf of Mexico. Nutrients from agriculture in central and southwest Florida are reaching the Gulf through the Caloosahatchee and other rivers and are likely contributing to micro-algae blooms in shelf waters. Surface currents can bring shelf waters into Florida Bay where they can flow into the ocean side of the Keys. Sources of nutrients found within Florida Bay may also feed blooms.

To help detect blooms in sanctuary waters, the sanctuary provides support and coordination to Mote Marine Lab's Tropical Research Center's Marine Ecosystem Event Response and Assessment (MEERA) Project. The MEERA system allows people to report blooms, which can then be tracked by scientists as well as provide outreach to the public at large (<http://isurus.mote.org/Keys/meera.phtml>).

Macro-algae Blooms: The sanctuary has worked closely over the years with FWC/Florida Wildlife Research Institute and other entities to investigate and track blooms, including investigating the cause of blooms of macro-algae that occur at coral reefs under certain conditions. Sudden blooms of macro-algae are often seasonal and associated with groundwater flows through the limestone rock. Identifying a nutrient source for macro-algal blooms can be a challenge because groundwater sources can be difficult to pinpoint and nutrient sources may differ for different macro-algae bloom events.

Future Actions

The sanctuary will use the information provided by MEERA to identify significant events taking place on the water and to aid in tracking long-term trends in events such as micro-algae and macro-algae blooms. Sanctuary resource managers will continue to fully utilize information obtained from the WQPP long-term water quality monitoring conducted in and around sanctuary waters. Measurements of chlorophyll values, salinity, temperature, turbidity and nutrient concentrations will provide a snapshot of water quality conditions in the Florida Keys and surrounding water bodies. These data, collected since 1994, can be used as a baseline by which to measure changes in sanctuary water quality conditions that may or may not take place as CERP, CEPP and other Everglades restoration management actions are implemented.

CEPP is expected to improve water quality conditions in Florida Bay and CERP Projects involving the Caloosahatchee River are expected to reduce nutrient inputs in Gulf waters upstream of the sanctuary.

10. Turbidity

A few commenters expressed concerns about poor visibility, turbidity and deteriorating water quality during the past several years. According to another commenter stated that NOAA should make water quality a top priority because of the declining water quality conditions. Poor visibility and a dying reef were mentioned as reasons that the Keys can no longer claim to be a world class dive destination for tourists. One commenter stated concerns about the green algae blooms that are causing poor visibility on the bayside of the Upper Keys and noted they seem to be getting worse each year.

Current Actions

Long-term water quality monitoring conducted through the WQPP includes tracking the water quality conditions by collecting data on chlorophyll values, salinity, dissolved oxygen, nutrients and turbidity (cloudiness/clarity) at sampling sites throughout the sanctuary. Turbidity can be caused by sediments suspended in the water or by dense populations of micro-algae floating in the water column. In shallow waters, bottom sediments and the organic matter trapped in them can be re-suspended into the water column by wind- and tidal-driven currents. The released organic matter can also fuel microalgal blooms that add to turbid conditions. Scientists usually measure turbidity using a black and white secchi disk to determine the water's visibility or with an instrument that measures the loss of light in the water column and calculates a corresponding light attenuation coefficient. Results from a recent WQPP special study showed that this coefficient can be determined using MODIS satellite data in waters greater than 5 meters deep, thereby providing scientists with new options for measuring widespread turbidity (http://ocean.floridamarine.org/fknms_wqpp/pages/special_projects.html). High turbidity is generally considered an undesirable condition because it can block sunlight, which in turn affects seagrass, corals and other organisms that require sunlight to live (http://oceanservice.noaa.gov/education/kits/estuaries/estuaries10_monitoring.html).

Long-term in situ monitoring indicates that water quality characteristics vary in different regions of the Keys. Bay and Gulf waters tend to be more turbid due to the influence of the sediments on the Southwest Shelf (an underwater extension of the Florida Peninsula) whereas waters on the ocean side tend to have better clarity due to the influence of ocean currents (http://ocean.floridamarine.org/fknms_wqpp/pages/wqmp.html). While natural differences in water bodies exist, NOAA agrees that there have been signs of declining water conditions in the recent past. WQPP research and other programs have investigated the source of nutrients and impacts of micro-algal blooms that cause green waters and poor visibility and the reasons for coral reef decline. (see Everglades/Florida Bay and Gulf of Mexico/Mississippi sections).

Declines in coral reefs in the Keys and elsewhere in the Caribbean are thought to be the result of a combination of factors: overfishing, habitat degradation, changing climatic conditions (ocean warming) and land-based sources of pollution (<http://floridakeys.noaa.gov/scipublications/condition.html>). Nutrients from land are a contributing factor to poor water quality. An excess of nutrients can cause micro-algae blooms in Florida Bay that flow to the ocean side of the Keys where they impact the coral reef ecosystem. Improvements in water quality are expected in time with these different management actions currently being carried out by agency restoration partners at federal and state levels and include projects that affect Florida Bay within Everglades National Park.

Future Actions

NOAA and other state, federal and local agencies will continue working together through the sanctuary's Water Quality Protection Program to monitor and improve water quality conditions in the near shore waters of the sanctuary. NOAA will continue collaborating with federal and state partners on Everglades/Florida Bay restoration projects that improve water quality in Florida Bay and Gulf of Mexico and lead to reduced turbidity due to human-influenced factors such as nutrients. NOAA will also provide feedback to the appropriate agencies on how restoration activities may be affecting sanctuary resources. Baseline conditions of water quality, seagrass and coral reefs have been documented through the long-term monitoring program of the sanctuary's WQPP (see Water Quality Monitoring and Research section) and can be used to measure changes as Everglades/Florida Bay restoration takes place on the mainland.

11. Gulf of Mexico/Mississippi River

Several commenters stated their concerns about impacts to sanctuary resources from poor quality waters that originate in the Mississippi River and Gulf of Mexico. Commenters point to impacts from micro-algae blooms, blackwater and dead zones that cause degradation of sanctuary coral reefs when passing near the Keys. For these reasons, several commenters called for restrictions on nutrient outflows from the Mississippi and one commenter urged EPA to better enforce water quality standards to restrict nutrient outflows from upstream sources. Another commenter questioned effectiveness of local regulations when waters originating elsewhere in the region are a primary cause of poor water quality in the Keys.

Current Actions

Clean Water Act (CWA): Sanctuary waters are downstream from discharges flowing from the Mississippi River and its tributaries. Nutrients and other pollutants that originate in the Mississippi River system can be carried by the Loop Current to the Keys where they can negatively impact coral reefs and other resources

(<http://floridakeys.noaa.gov/scipublications/condition.html>). Enforcement of land-based discharges into the Mississippi River and its tributaries are the responsibility of EPA in conjunction with state and local environmental regulators. EPA works with its federal, state and tribal regulatory partners through a comprehensive Clean Water Act (CWA) compliance monitoring program to protect human health and the environment by ensuring that the regulated community obeys environmental laws/regulations through on-site visits by qualified inspectors, and a review of the information EPA or a state/tribe requires to be submitted. The CWA compliance assistance program provides businesses, federal facilities, local governments and tribes with tools to help meet environmental regulatory requirements

(<http://www.epa.gov/compliance/monitoring/programs/cwa>).

Gulf of Mexico Alliance (GOMA): The Gulf of Mexico Alliance (GOMA) is a partnership of Gulf States, including Florida, formed to increase regional coordination for the purpose of enhancing the ecological and economic health of the Gulf of Mexico

(<http://www.gulfofmexicoalliance.org/index.php>). Water quality at beaches and nutrients and nutrient impacts are two priority issues that have been addressed by the Alliance. GOMA partners are engaged in regional initiatives such as the Mississippi River-Gulf of Mexico Watershed Nutrient Task Force (Hypoxia Task Force). This task force, which consists of 5 federal agencies, 12 states and tribes within the Mississippi River Basin, released its action plan in 2008 as a national strategy and roadmap to reduce hypoxia (low dissolved oxygen) in the northern Gulf of Mexico and improve water quality in the Mississippi River Basin.

Implementation of the plan has resulted in nutrient reduction in several of the 31 states with tributaries that are part of the Mississippi River Basin

(<http://water.epa.gov/type/watersheds/named/msbasin>).

Future Actions

EPA and FDEP are dedicated to strong monitoring and enforcement of the Clean Water Act. These agencies and other organizations also provide information on ways people can reduce their nutrient and chemical inputs into local water bodies that feed into the Gulf of Mexico/Mississippi River. NOAA supports current and additional measures that help prevent nutrients and other pollutants originating in the Mississippi and/or Gulf of Mexico from entering sanctuary waters. The Gulf of Mexico Alliance and the Hypoxia Task Force will continue to implement its management plan containing action designed to reduce nutrient inputs and hypoxia events in Gulf waters, which are upstream of the Florida Keys. Corals and other marine life in the sanctuary thrive best in low nutrient waters. Upgrades in wastewater and stormwater treatment are important and necessary because under certain conditions, near shore waters of the sanctuary have been known to be strongly influenced by local (Keys-based), rather than regional inputs.

12. Mosquito Control

Two comments identified concerns regarding mosquito control in the Florida Keys. One commenter urged NOAA and USFWS to “evaluate all published research, both local and abroad, on mosquito spraying in near shore waters” to improve understanding of the potential effects of pesticides, especially the aerial spraying of naled and permethrin adulticides. This commenter indicated that the use of naled and permethrin was being abused. The other commenter called for studies on mosquito control practices to determine if they are causing pollution.

Current Actions

Insecticides to control mosquito-borne pathogens like West Nile virus, Dengue Fever, Chikungunya, and viral encephalitis can enter sanctuary near shore waters through aerial spraying or from runoff. The Florida Keys Mosquito Control District, represented on the steering committee of the WQPP, has an active research program focused on basic and applied aspects of mosquito biology and control (<http://keysmosquito.org>). Several years ago, significant improvements were made in methods used to apply insecticides, but concerns still exist. The Mosquito Control District provides outreach to educate Keys residents on ways to prevent mosquitos from breeding in yards and around buildings. Research conducted by FWC/FWRI using WQPP/EPA funds has found detrimental effects on queen conch larvae from mosquito insecticides (http://ocean.floridamarine.org/fknms_wqpp/pages/special_projects.html). Other non-target organisms are also at risk of being impacted and further research is underway to determine the effects of two commonly used insecticides on larvae of spiny lobster (*Panulirus argus*) and shallow-water starlet coral (*Porites asteroides*). Results of this collaborative project between Mote Marine Laboratory and FWC/FWRI will be brought before the WQPP steering committee for consideration.

Future Actions

The Florida Keys Mosquito Control District is expected to continue its research program and modify its methods of application accordingly. One area of research that is currently being examined involves sterilizing males in a non-native species (*Aedes aegypti*) of mosquito that carries a host of disease pathogens. Perfection of techniques needed to implement this approach are still being developed, but when completed could result in modifications/reductions in the application of traditional insecticides. Results of the Mote/FWRI study on how two commonly used mosquito insecticides affect the larvae of shallow-water starlet coral and spiny lobster will be brought before the WQPP steering committee for consideration and possible action.

13. Endocrine Disruptors

Some commenters identified concerns about endocrine disrupters and other chemicals that can enter near shore waters and negatively affect marine life. One commenter suggested NOAA should address issues relating to human-related releases of endocrine disrupters, antibiotics, hormones and sunscreens. This goal could be accomplished by utilizing recent research on these substances, not using dilution as a solution to pollution, and through partnerships with medical doctors and Blue Star dive shops to increase awareness. Another commenter would like to see all agencies make it a priority to improve marine water quality by addressing herbicides, pesticides,

fertilizers and other contaminants from both Keys-based and outside sources and called for “strict regulations enforced with regular monitoring”.

Current Actions

EPA and Pesticides: The near shore waters of the Florida Keys National Marine Sanctuary are subject to the impacts of pollution from chemicals, including pesticides, herbicides, and pharmaceuticals, that enter the system in several ways: runoff from land, carried by ocean currents or carried by atmospheric currents. Certain pesticides and pharmaceuticals containing antibiotics or hormones may have adverse effects on marine life if present in high enough concentrations (<http://www.dep.state.fl.us/waste/categories/medications>).

In accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), EPA requires that all pesticides be registered unless the product meets the criteria for a minimum risk pesticide. EPA evaluates the risks of pesticide use (and a host of other substances) to ensure that they will not harm people, non-target species or the environment when used according to direction labels. These risks are evaluated based on proper use and disposal of the product and people should adhere to product label instructions to prevent substances from entering waterways. EPA funds pesticide research to evaluate the effects of pesticide exposure on human health and wildlife. Herbicides are pesticides that target plants and can have unintended effects on non-target plants, which affects animals in the food web. Unless an herbicide meets certain criteria, it must be registered with EPA where it is subject to evaluation.

Endocrine Disruptors: Endocrine disruptors are chemicals that mimic human and animal hormones, resulting in adverse impacts to the organism’s endocrine or “hormone” system. Many pesticides used in agriculture are endocrine disruptors and in certain concentrations can negatively affect reproduction in animals not targeted by the pesticide. Because of the potential and known impacts on aquatic life and people, EPA has conducted extensive research into endocrine disruptors and is currently developing innovative approaches, tools, models and data to improve the understanding of potential risks to human health and wildlife from these substances. The findings of EPA’s endocrine research are used by the EPA Endocrine Disruptor Screening Program and to inform policy and regulatory decisions of EPA Program Offices, EPA Regions and other decision makers (<http://www.epa.gov/research/endocrinedisruption/aqueff.htm>).

Pharmaceuticals and Personal Care Products: EPA defines *Pharmaceuticals and Personal Care Products as Pollutants* as any product used by individuals for personal health or cosmetic reasons or used to enhance growth or health of livestock. Thousands of chemical substances, including prescription and over-the-counter therapeutic drugs, veterinary drugs, fragrances, and cosmetics belong in this category. Studies have shown that pharmaceuticals enter our nation's water bodies through sewage, run-off, and improper disposal. Hormones, including steroids, and pharmaceuticals have been detected in Keys waters with higher concentrations found primarily in canals and restricted water bodies near heavier areas of human habitation (<http://www.ncbi.nlm.nih.gov/pubmed/19779818#>). The effects on marine life of these chemicals are not fully known, but steroids and other hormones can be endocrine disruptors.

The EPA is committed to developing strategies to help protect the health of both the environment and the public. To date, scientists have found no evidence of adverse human health effects from

pharmaceuticals and other substances in the environment, but there are still reasons for concern (<http://www.epa.gov/ppcp/>). Improper disposal of pharmaceuticals and other chemical substances can however negatively affect aquatic life. Effective removal of these substances from sewage treatment plants varies based on the type of chemical and on the individual sewage treatment facility.

In the Florida Keys, Monroe County's Sheriff's Department has a Medicine disposal program. Prescription drugs can be dropped off at sheriffs' offices throughout the county during office hours for proper disposal. This drop off program, along with educating people not to dispose of pharmaceuticals by pouring them down the drain or toilet, will help keep pharmaceuticals and other unwanted substances out of near shore waters. FDEP provides extensive information regarding medicines and how to dispose of them properly (<http://www.dep.state.fl.us/waste/categories/medication>).

A wide variety of sunscreen products exist on the market. Even waterproof sunscreen is known to wash off of divers and snorkelers into seawater where it has the potential for affecting marine life. Sunscreens that contain toxins and persist in the environment, rather than biodegrading quickly can be harmful to marine life. In a 2008 research study, oxybenzones and assorted parabens found in sunscreens were linked to coral bleaching and viral infections in corals. Titanium dioxide and zinc oxide are sunscreen ingredients that protect skin from harmful sunrays by either absorbing ultraviolet light or reflecting and scattering rays. Proponents of zinc oxide and titanium dioxide sunscreens state that these substances are insoluble and merely sink to the seafloor when they wash off users. Others point out that zinc is a heavy metal known to be toxic to fish. Additionally, in recent years both substances have become available as extremely small particles called nanoparticles. Nanoparticles of titanium and zinc oxide are used widely in sunscreens, cosmetics and other products. Because of their small particle size, concerns exist that they could be absorbed through human skin. For this reason and the fact that titanium dioxide is also used in wastewater treatment, EPA recently released the results of case studies conducted to identify the information needed to conduct a comprehensive environmental assessment of the potential risks related to use of these substances
<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=230972>.

Education/Outreach-Waterways TV and Blue Star: To provide information to the public and increase awareness on endocrine disruptors, a *Waterways Television* program called "Pharmaceuticals in Our Waters" was produced and has aired on local television channels and on YouTube. "Waterways" series is a joint project between Florida Keys National Marine Sanctuary, Everglades National Park and EPA and is funded by the EPA through the WQPP. This episode will continue to air on television and YouTube and can be used as an educational tool in the classroom (<http://www.youtube.com/watch?v=aOG6uTMgpas>). Sanctuary educators also incorporate water quality best management practices into their presentations to the public and school students. NOAA's Blue Star program is a voluntary program for dive operators that promotes environmentally sound practices on the water (<http://floridakeys.noaa.gov/onthewater/bluestar.html>). NOAA encourages Blue Star operators and others are encouraged to find out about different sunscreen products and make a wise and safe choice.

Future Actions

NOAA will continue to support EPA and FDEP in their agency roles to protect water quality in sanctuary waters and strictly enforce all regulations in accordance with federal and state environmental laws. NOAA will improve efforts to educate the public on water quality issues by communicating best management practices regarding pharmaceuticals, pesticides and other chemicals. EPA is committed to protecting human health and the environment and will continue to implement a variety of programs designed to evaluate and regulate chemicals. This information based on research and risk evaluations will be essential in making decisions regarding the use and application of chemical substances.

14. Marine Debris

Several commenters recognized the seriousness of the marine debris issue and expressed concerns about the negative impacts of debris on sanctuary natural resources, especially on corals and on beaches. Concerns included the following: the accumulation and impacts of trap debris, fishing line and angling gear; the amount of trash and plastic accumulating in entering sanctuary waters entering from land, specifically roadways. Suggestions to improve conditions include increasing efforts and funding to clean up marine debris, providing better education to promote prevention and properly disposing of trap and angling gear and trash originating on land or at sea.

Current Actions

Impacts of Marine Debris: Marine debris includes a variety of items that pose a threat to the marine environment/marine life, human health or navigation. Fishing gear, plastic bags, polystyrene foam and other debris are known to have adverse effects on marine life. Ingestion and entanglement are two main problems facing sea turtles, marine birds, corals and other marine life. Derelict and lost traps and other fishing gear cause harm by continuing to “fish” (<http://floridakeys.noaa.gov/scipublications/condition.html>).

As plastics degrade in the sun, they can release harmful chemicals that can impact organisms. Tiny pieces of plastic called micro-plastics accumulate in the water column and may be consumed by marine life at different levels of the food web (<http://marinedebris.noaa.gov/info/plastic.html#goaway>).

Outreach and Prevention: The increasing levels of debris in both the ocean and along the coast are a growing concern of sanctuary managers. Over the years, the sanctuary, non-profit organizations and other agencies have conducted awareness campaigns to educate people about how keep their trash and gear from entering sanctuary waters. Sanctuary educators incorporate messages about marine debris prevention in their public and school programs. Sanctuary education staff has been involved in coordinating the International Coastal Cleanup for nearly 15 years. This event involves Keys-wide cleanups at various shorelines and underwater locations (<http://www.oceanconservancy.org>). The sanctuary also conducts regular marine debris clean-ups with its Team OCEAN volunteers (http://floridakeys.noaa.gov/volunteer_opportunities/teamocean.html?s=involved). Between 2007 and 2012, sanctuary volunteers removed more than 36,000 pounds of marine debris from

sanctuary waters. While clean-ups have been successful, debris still accumulates. Discharging trash into sanctuary waters is against sanctuary regulations. Reef Relief, a Key West based non-profit organization, offers tips to boaters to help prevent losing trash overboard. Reef Relief's *Don't Teach Your Trash to Swim* timeline poster shows how long it takes trash to degrade and is used in education programs with students and adults. (<http://reefrelief.org/learn/educational-material/eco-timelineenglish1>). Dolphin Research Center also incorporates marine debris lessons in its public and school programs at its facility on Grassy Key (http://www.dolphins.org/conservation_tips?aid=4).

Elkhorn and Staghorn Coral Protections: To protect elkhorn and staghorn corals from lobster trap impacts, NOAA National Marine Fisheries Service implemented no-trap zones. In 2012, sixty no-trap zones became effective around known stands of elkhorn and staghorn corals, both listed as threatened on the Endangered Species List (<http://www.safmc.net/FishIDandRegs/FishGallery/SpinyLobster/tabid/331/Default.aspx>). The sanctuary has supported long-term research tracking the status of these and other important reef-building corals. Coral surveys conducted by scientists working grant funds from NOAA's Coral Reef Conservation Program helped identify the locations of stands of coral for the no-trap zone protection. These long-term surveys also quantified the impacts of fishing gear/line and trap gear on benthic marine life, specifically corals and sponges. During the surveys, scientists removed debris whenever removal of the debris would not cause injury to marine life growing on the item. A two page fact sheet describing the results of the debris surveys is available on the sanctuary's website: <http://floridakeys.noaa.gov/scisummaries/marinedebris2013.pdf>. According to survey results, some protection from angling gear and trap gear impacts may be afforded by sanctuary no-take marine zones such as Sanctuary Preservation Areas (SPAs); recent data have shown a greater concentration of debris outside of zones as compared to inside zones where fishing/lobstering does not take place.

NOAA has also worked with FWC and lobster fishermen to address issues of trap movement associated with hurricanes and storms, including conducting research studies to test how traps can move around under different conditions and quantifying the impacts of traps on marine life. Retrieval of traps that have moved during storms and may be impacting corals is also carried out by lobster trap fishermen after the storm passes.

Future Actions

The sanctuary is committed to the challenge of keeping trash and other debris from entering sanctuary waters from land or sea. In addition to removal by volunteers, a more systematic approach with dedicated funding will be explored to address this issue. Team OCEAN cleanups are an ongoing activity conducted by volunteers and sanctuary education staff. NOAA will continue to implement no-trap zones and evaluate their effectiveness in protecting elkhorn and staghorn coral. Other opportunities to reduce the impacts of angling gear and trap debris, along with plastics, may be explored by sanctuary management and fisheries scientists. Street litter will be less likely to enter near shore waters with the upgrades to stormwater treatment systems that are taking place in the Florida Keys (see the Safe Beaches and Wastewater Treatment /Stormwater Runoff sections).

15. Climate Change/Ocean Chemistry

Commenters noted there is scientific consensus that ocean warming, ocean acidification and disease are causing ecosystem degradation and that wastewater, stormwater runoff, sedimentation and other factors that can be addressed more readily should be given the highest priority. Another commenter expressed a similar concern: increasing stress from global climate change makes it even more important to address other stressors in an expedited manner to help sustain coral reefs.

Current Actions

Land-based Nutrients and Water Quality: NOAA has made water quality a high priority since the designation of the Florida Keys National Marine Sanctuary in 1990. Management actions taken on land to virtually eliminate nutrient inputs into sanctuary waters from wastewater and stormwater are expected to be complete by 2020 and will help reduce stressors from local land-based nutrients on coral reefs and associated marine life. Addressing local threats to sanctuary resources by providing the best possible water quality conditions will help give corals the best possible chance of surviving when impacted by global threats of ocean warming/climate change and ocean acidification.

Global Climate Change and Ocean Warming: Climate is determined by the long-term patterns of temperature and precipitation in an area and includes the averages and extremes. *Climate change* is a significant difference in an area's average climate conditions or their extremes and can be an ongoing process http://oceanservice.noaa.gov/education/literacy/climate_literacy.pdf. Observations of the climate system are based on direct measurements, remote sensing from satellites and other independent lines of evidence. Scientific observations made around the world confirm that Earth's average temperature is now warmer than it has been in the past 1,300 years. According to the 2013 Intergovernmental Panel on Climate Change (IPCC) report, average land and ocean surface temperature shows an unprecedented warming trend of 1.54 ° F (0.85 ° C) between 1880 and 2012. (<http://www.ipcc.ch/report/ar5/wg1/>).

During this time and especially since the 1950s, several changes have become apparent. The atmosphere and ocean have warmed, atmospheric concentrations of greenhouse gases have increased, the amounts of ice and snow have diminished and sea level has risen. The overwhelming scientific evidence links these dramatic changes related to the widespread burning of fossil fuels, which releases CO² and other greenhouse gases into Earth's atmosphere. Greenhouse gases warm Earth's atmosphere by trapping the sun's energy and that also warms the ocean.

Sanctuary managers and NOAA's Coral Reef Conservation Program (CRCP) are concerned about global climate change and the effects of increasing ocean temperatures on corals and other marine life. NOAA's CRCP has taken a global approach to climate change and works closely with the US Coral Reef Task Force to support its mission of managing the nation's coral reef resources (<http://www.coralreef.gov/>). Climate change has been identified as one of the major threats to coral reef ecosystems of the world (<http://coralreef.noaa.gov/threats/climate/>). Widespread bleaching and infectious disease in reef corals have been linked to higher seawater temperature conditions (<http://floridakeys.noaa.gov/scipublications/condition.html>). NOAA's

CRCP provides funding for NOAA's Coral Disease and Health Consortium, which grew out of the need to investigate and share coral disease information. According to the consortium, the prevalence and incidence of coral disease reports has grown markedly since the first disease, black band, was reported in 1972 (<http://cdhc.noaa.gov/disease/>). Other NOAA offices and programs collect climate data that are critical in understanding and monitoring changing ocean and atmospheric conditions <http://www.noaa.gov/climate.html>.

Several studies and programs are in place to meet the challenges of managing coral reefs for the future. Beginning in 1989, the sanctuary deployed thermographs in strategic areas throughout the Florida Reef Tract to record long-term water temperatures. Other state and academic researchers have also been collecting *in-situ* water temperature data and information useful in managing coral reefs and other marine resources. The Coral Reef Evaluation and Monitoring Program (CREMP) has been monitoring coral condition, status and trends for over fifteen years in sanctuary waters (http://ocean.floridamarine.org/FKNMS_WQPP/pages/cremp.html). CREMP is one of the three long-term monitoring programs part of the WQPP. FWC Fish and Wildlife Research Institute scientists conduct CREMP monitoring and regularly provide updates to the sanctuary managers and members of the WQPP steering committee.

The Florida Reef Resilience Program (FRRP) seeks to develop resilience-based management strategies for coping with ocean warming and other stresses on Florida's coral reefs (<http://frfp.org>). As changes in climate take place, corals with resilience or the ability to resist or bounce back from impacts are most likely to adapt and survive. FRRP is a collaborative program managed by The Nature Conservancy that involves managers, scientists, conservation organizations and reef users. Sanctuary scientists participate in the program by conducting monitoring surveys designed to rapidly assess coral condition and health at sanctuary reefs during peak annual water temperatures. Field monitoring also occurs after disturbances like the cold-water event of January 2010. Surveys identify coral bleaching and paling prevalence and provide critical information needed to manage coral reefs under changing environmental conditions. The FRRP has also developed a Climate Change Action Plan for the Florida Reef System 2010-2015 (<http://frfp.org/publications-resources>). The plan notes that two major factors will dictate the future health of coral reefs: the rate and extent of climate change and the resilience of reefs to those changes. The plan identifies ways to increase reef resilience to climate change and minimize negative impacts of reef-dependent industries such as snorkeling, diving and recreational fishing.

With support from the Florida Keys National Marine Sanctuary, Mote Marine Laboratory, created Florida Keys Bleach Watch, a program modeled after the Great Barrier Reef Marine Park Authority's "Bleach Watch". Bleach Watch volunteers provide reports from the reef on the actual condition of corals throughout the sanctuary during the bleaching season. These field observations help to monitor for signs of coral bleaching. Information gathered from Bleach Watch is compiled into a "Current Conditions Report" that provides a comprehensive overview of current conditions throughout the sanctuary (<http://isurus.mote.org/research/trl/bleaching.phtml>).

Ocean Acidification: Research findings in recent years have detected a trend toward increasing acidity in ocean seawater. Changes in seawater chemistry toward higher acidity (and a lower pH)

are driven by increases in levels of dissolved CO² in seawater. Higher concentrations of CO² are related to increased concentrations of CO², methane and other greenhouse gases in the atmosphere. Atmospheric increases have resulted from the widespread burning of fossil fuels and deforestation of large land areas. This shift toward more acidic seawater, called ocean acidification, can directly affect corals and other organisms that form supporting skeletal structures made of calcium carbonate minerals (CaCO₃), specifically aragonite and calcite. The rate and degree to which skeletal structures can form and/or dissolve is influenced by acidity of seawater. Research studies have been done to determine how changes in acidity affect corals, mollusks and other marine life and to aid managers in identifying the research questions that are pertinent and management actions that need to be taken

(http://coralreef.noaa.gov/aboutcrp/strategy/reprioritization/wgroups/resources/climate/resource/oa_research_nds.pdf). NOAA's Coral Reef Conservation Program has developed an Ocean Acidification Science Plan intended to address management challenges associated with ocean acidification

(<http://oceanacidification.noaa.gov/sites/OceansAcidification/Documents/CRCP%20Ocean%20Acidification%20Science%20Plan%202012-2016%20FINAL.pdf>).

Future Actions

Local, state and federal agencies and partners have worked together for several years to implement wastewater and stormwater improvements designed to reduce local nutrient inputs into near shore waters and provide improved water quality for coral reefs and other marine life. When making management decisions, sanctuary resource managers will utilize information derived from FRRP, CREMP, Bleach Watch, disease research and other scientific studies on the status and resilience of coral reefs in sanctuary waters. At the global level, sanctuary managers will have the benefit of NOAA's oceanographic and climatic research that seeks to understand and predict changing environmental conditions (<http://coralreefwatch.noaa.gov/satellite/index.php>).

NOAA actively participates in the U.S. Coral Reef Task Force and will continue to work with others involved in coral reef management at the national, state and local levels to support the task force mission. With its role in climate research, NOAA's line offices (National Ocean Service, National Weather Service, Oceanic and Atmospheric Research and National Environmental Satellite, Data and Information Service) will continue to collaborate and be key information providers as climate change takes place and develop climate tools that will be used to inform sanctuary managers (<http://www.climate.gov/> and <http://www.cpc.ncep.noaa.gov/>). The sanctuary supports efforts by individuals, companies, government agencies and other entities to adopt environmental practices that reduce the use of fossil fuels thereby helping to decrease their contribution to atmospheric greenhouse gases.

Appendix III: Summary of Law Enforcement Activities

Background

Law enforcement continues to be identified as a significant resource management issue for the Florida Keys National Marine Sanctuary (FKNMS). During the Marine Zoning and Regulatory Review process, FKNMS received comments from the Florida Keys National Marine Sanctuary Advisory Council (advisory council), advisory council working groups, and the public indicating the need to increase the number of law enforcement officers on the water and resources available to them, and also increase collaboration to re-develop the critical law enforcement resources needed to ensure long-term success of the FKNMS program and its priorities.

A sufficient enforcement presence within the sanctuary is necessary to deter violations and enforce regulations. Successful enforcement relies on frequent water patrols and routine vessel boardings and inspections. Water patrols ensure that sanctuary users are familiar with regulations in order to deter willful or inadvertent violations and provide quick response to violations and emergencies.

FKNMS also relies heavily on education and outreach activities to promote and enhance voluntary compliance. This approach emphasizes informing the public through educational messages and literature about responsible behavior that helps avoid adverse impacts to resources. Officers talk directly with users and distribute brochures in the field and throughout the community; such encounters allow officers to make direct, informative contact with visitors and local residents while conducting routine enforcement activity. The goal is to gain the greatest level of compliance through understanding and public support of sanctuary goals.

Enforcement Partners

Law enforcement in the sanctuary is accomplished directly and in partnership with the following entities:

1. NOAA Office of Law Enforcement (OLE)
2. NOAA Office of General Counsel Enforcement Section (GCES)
3. NOAA Office of General Counsel Natural Resources Section (GCNR)
4. U.S. Coast Guard (USCG)
5. U.S. Fish and Wildlife Service Office of Law Enforcement (USFWS-OLE)
6. National Park Service
7. Florida Fish and Wildlife Conservation Commission Law Enforcement (FWC-LE)
8. Monroe County Sheriff's Office (MCSO)

Each of these partner agencies has a distinct authority, role, suite of assets, and funding source.

1. NOAA Office of Law Enforcement

NOAA's Office of Law Enforcement (OLE) protects marine wildlife and habitat by enforcing more than 35 federal statutes and international treaty requirements designed to ensure these global resources are available for future generations. OLE special agents and enforcement officers ensure compliance with the nation's marine resource laws and take enforcement action when these laws are violated. In addition to providing enforcement expertise on international, sustainable fisheries, and protected resources policies, NOAA OLE spearheads collaborative

programs with 27 states and U.S. territories, commercial fishermen, and educational institutions such as aquariums, schools, and zoos.

NOAA OLE establishes annual enforcement priorities to help focus resources and strategically use state and federal partnerships to monitor the more than 3,000,000 square miles of open ocean and 95,000 miles of U.S. coastline over which they have jurisdiction. These priorities improve their ability to rebuild and protect the public's fisheries and other national resources and to protect the many fishermen who play by the rules. NOAA OLE develops these priorities through a collaborative process with participation from the fishery management councils, interstate fishery commissions, and interested stakeholders, including fishermen and public, private, and nongovernmental organizations.

NOAA OLE Southeast Division's divisional office is located in St. Petersburg, FL and its coastal area of responsibility encompasses the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Puerto Rico and the U.S. Virgin Islands (USVI). These 8 coastal states and 2 island territories comprise 3,700 miles of coastline with 29,900 miles of tidal shoreline and contain four National Marine Sanctuaries. The region is governed by 40% of the Nation's coastal state resource agencies, three Regional Fisheries Management Councils and two Interstate Marine Fisheries Commissions. Additionally, the region supports the largest recreational fisheries in the Nation.

The Southeast Division has a broad range of enforcement responsibilities in recreational and commercial marine fisheries, from covering finfish such as snapper and grouper and including commercial catch share programs to Highly Migratory Species such as shark, tuna and swordfish. In addition, the Southeast Division monitors protected resources such as dolphins and marine turtles and three National Marine Sanctuaries (FKNMS, Gray's Reef and Flower Garden Banks).

NOAA OLE Southeast Division has two special agents stationed in the Florida Keys who are responsible for conducting criminal and civil investigations for violations of the Magnuson-Stevens Fisheries Conservation and Management Act, Endangered Species Act, Marine Mammal Protection Act, Lacey Act, and National Marine Sanctuaries Act (NMSA). For 2013, NOAA OLE has identified the following violations of the NMSA as priorities for these special agents:

- High Priority
 - Any discharge of materials injurious to sanctuary resources
 - Prohibitive taking of commercial quantities of sanctuary artifacts or protected marine resources
 - Damage caused by negligent acts or violation of law/regulation, damage to sanctuary natural resources (i.e. vessel grounding, anchoring in unlawful areas, setting and illegal use of habitat)
- Medium Priority
 - Unlawful fishing and/or use of restricted fishing gear
- Low Priority
 - Unlawful operation of vessel/aircraft/conveyance

Regional priorities like those above allow NOAA OLE to focus on area-specific resources, activities, and threats. Setting regional priorities helps focus enforcement work as effectively and efficiently as possible. While these identified priorities are the 2013 focus, NOAA OLE continues to encourage compliance and enforce all marine statutes and regulations for which it is responsible.

2. NOAA Office of General Counsel Enforcement Section

NOAA's General Counsel Enforcement Section (GCES) coordinates and implements the NOAA General Counsel's delegated authority as NOAA's civil prosecutor. The office prosecutes civil penalty cases, permit sanctions, and administrative forfeitures; provides support to the U.S. Department of Justice in prosecution of law enforcement cases in federal courts and formulates NOAA's position in such cases; establishes national law enforcement policy in conjunction with NOAA OLE and NOAA program offices; provides legal support to NOAA OLE and other NOAA offices, including the Office of Sustainable Fisheries the Office of Protected Resources, and the Office of National Marine Sanctuaries (ONMS); and advises NOAA officials on specific enforcement cases and general enforcement trends and issues. The office has fourteen attorneys, one paralegal specialist, and one support staff.

NOAA attorneys assigned to a case, in consultation with the investigating officer or agent, evaluate whether evidence in the case demonstrates a violation of a NOAA statute or regulation, and determine whether to recommend (1) charging the alleged violator or (2) declining the case. All charging or declination recommendations by NOAA attorneys are made to the NOAA General Counsel or Deputy General Counsel for final approval. If the NOAA attorney determines that it is appropriate to recommend filing charges, the attorney then has a number of charging options. For relatively minor violations, the attorney may recommend a Written Warning. Written Warnings are appropriate where the alleged activity has a limited impact on natural resources, the alleged violator demonstrates a high degree of cooperation, the alleged violator takes corrective action that substantially mitigates or eliminates the impact of the violation, or a substantial amount of time has passed from the date of the violation. For more significant violations, the NOAA attorney may recommend charges under NOAA's civil administrative process (*see* 15 C.F.R. Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may determine that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney's Office for criminal prosecution.

3. NOAA Office of General Counsel Natural Resources Section

NOAA's General Counsel Natural Resources Section (GCNR) provides legal advice to the National Marine Fisheries Service and the National Ocean Service, and seeks monetary restitution from responsible parties for injuries caused to our Nation's natural resources by releases of hazardous substances from waste sites, oil spills, and physical impacts (e.g., vessel groundings) to unique resources located in National Marine Sanctuaries. The Section has fourteen attorneys, a program coordinator, one paralegal, and three support staff.

NOAA GCNR attorneys work closely with NOAA's Damage Assessment, Remediation, and Restoration Program (DARRP) collaborating with other agencies, industry, and citizens to

protect coastal and marine resources, respond to pollution incidents, assess risk and injuries, and restore those resources when injured. NOAA's DARRP encourages responsible parties to participate in cooperative damage assessment and restoration planning activities. By focusing on restoration early in the process, NOAA integrates risk and injury assessments with cleanup and restoration planning. This offers industry a practical and cost-effective way to resolve liability. In addition to working cooperatively with responsible parties at oil spills and hazardous waste sites, DARRP regularly convenes industry, government, non-governmental organizations, and other stakeholder groups to identify methods for improving assessments and cleanups, reducing costs, and restoring resources more quickly and more effectively. Through such innovative partnerships, NOAA is working to reverse the effects of coastal contamination and ensure that the environment is protected and restored.

4. United States Coast Guard

The United States Coast Guard (USCG) is one of America's front-line services for maritime commerce, science, security, and environmental resilience. By law, the USCG has 11 missions.

Listed in order of percent of operating expenses:

- Ports, waterways, and coastal security
- Drug interdiction
- Aids to navigation
- Search and rescue
- Living marine resources
- Marine safety
- Defense readiness
- Migrant interdiction
- Marine environmental protection
- Ice operations
- Other law enforcement

Of these 11 mission areas, Living marine resources, Marine safety, and Marine environmental protection are directly applicable to the sanctuary.

The USCG operates under two legal authorities: 14 U.S.C. § 2 which empowers the USCG to "enforce all applicable federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States", and 14 U.S.C. § 89 which provides USCG "authority to search, exam, arrest, seize, inspect, and inquire in appropriate circumstances." USCG has authority to enforce 24 different statutes under these authorities, including the NMSA and FKNMSPA.

USCG operations within the Florida Keys are managed primarily by Sector Key West with Stations in Key West, Marathon, and Islamorada (see Figure I.I for area covered by each Station and Sector Key West), and support from Sectors Miami and St. Petersburg.

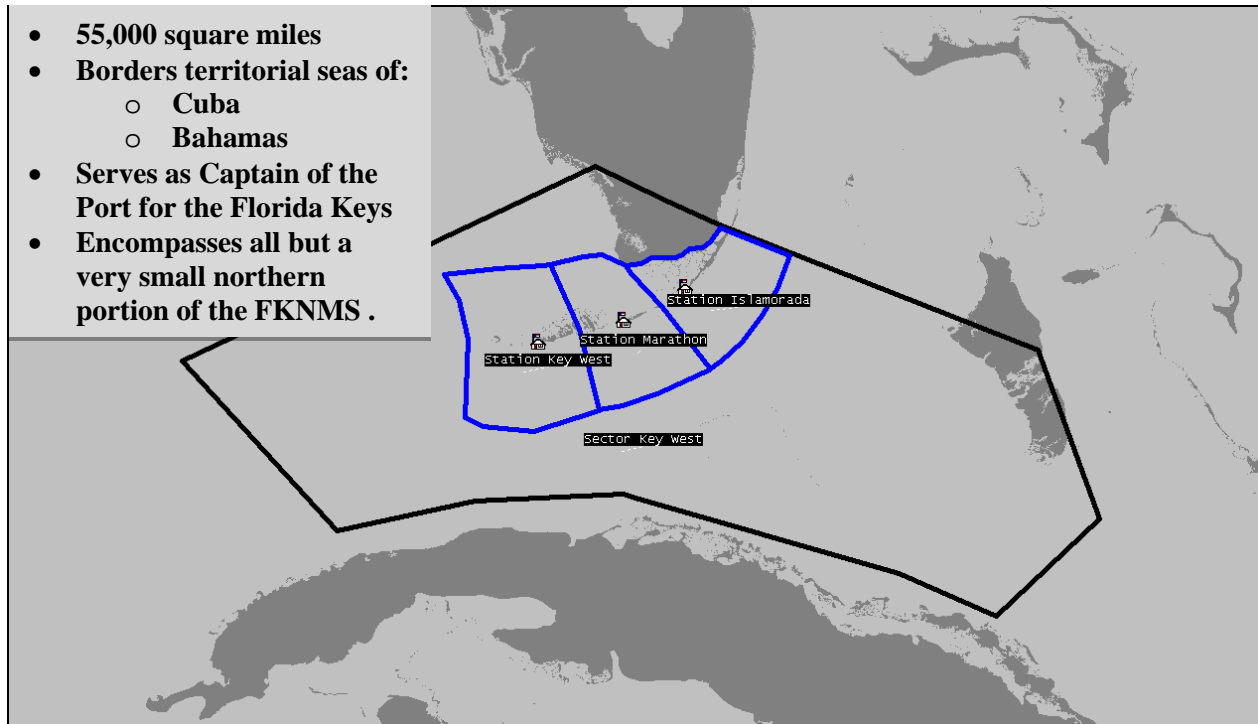


Figure I.I. U.S. Coast Guard Sector and Station delineations relevant for the Florida Keys National Marine Sanctuary.

Key West Sector capabilities include the Response Department (Enforcement), Prevention Department (Safety and Environmental Protection), and Auxiliary (Civilian).

Response Department: Assets include a range of patrol boats and small boats along with air assets available from both Miami and Clearwater. Patrol boat sanctuary enforcement issue areas include Tortugas Ecological Reserve, Area to be Avoided, shrimp vessel incursions along FKNMS and Gulf of Mexico border, Gulf of Mexico and South Atlantic Fishery Management Council regulations, and Lacey Act violations. USCG small boat capabilities and enforcement focus areas include sanctuary marine zone regulations (Wildlife Management Area, Sanctuary Preservation Area, Western Sambo Ecological Reserve, Existing Management Areas, Special Use Areas), Area to be Avoided, marine sanitation/discharge requirements, Gulf of Mexico and South Atlantic Fishery Management Council regulations, and Lacey Act violations.

Prevention Department: Divisions include Inspections which is charged with environmental protection responsibilities on vessels and facilities, Waterways Management has responsibility for Aids to Navigation, and Investigations focuses primarily on pollution.

Auxiliary: Contributions include boater education patrols, distribution of educational information, inform users about and maintain integrity of the sanctuary marine zones, and relay locations of heavy traffic to USCG small boat stations. The USCG Auxiliary provides training sessions, patrols when volunteers are available; however has no law enforcement authority.

While security, drug interdiction, aids to navigation and search and rescue are the highest USCG priorities, USCG is an essential partner in enforcing FKNMS regulations (for more information, see the section on Interagency Agreements Establishing Cross-agency Enforcement Authority).

5. U.S. Fish and Wildlife Service Office of Law Enforcement

The U.S. Fish and Wildlife Service Office of Law Enforcement's (USFWS-OLE) mission is to protect wildlife and plant resources. Through the effective enforcement of federal laws, USFWS-OLE contributes to the USFWS efforts to recover endangered species, conserve migratory birds, preserve wildlife habitat, safeguard fisheries, combat invasive species, and promote international wildlife conservation. The USFWS-OLE focuses on potentially devastating threats to wildlife resources including illegal trade, unlawful commercial exploitation, habitat destruction, and environmental contaminants. The USFWS-OLE investigates wildlife crimes, regulates wildlife trade, helps Americans understand and obey wildlife protections laws, and works in partnership with international, state, and tribal counterparts to conserve wildlife resources. This work includes:

- Breaking up international and domestic smuggling rings that target imperiled animals
- Preventing the unlawful commercial exploitation of protected U.S. species
- Protecting wildlife from environmental hazards and safeguarding critical habitat for endangered species
- Enforcing federal migratory game bird hunting regulations and working with states to protect other game species from illegal take and preserve legitimate hunting opportunities
- Inspecting wildlife shipments to ensure compliance with laws and treaties and detect illegal trade
- Working with international counterparts to combat illegal trafficking in protected species
- Training other federal, state, tribal, and foreign law enforcement officers
- Using forensic science to analyze evidence and solve wildlife crimes
- Distributing information and outreach materials to increase public understanding of wildlife conservation and promote compliance with wildlife protection laws

When fully staffed, the USFWS-OLE includes 261 special agents and some 140 wildlife inspectors. Most are "officers on the beat" who report through eight regional law enforcement offices. The USFWS-OLE headquarters office provides national oversight, support, policy, and guidance for USFWS investigations and the wildlife inspection program; trains USFWS-OLE personnel; fields a special investigations unit; and provides budget, management and administrative support.

The USFWS-OLE has two enforcement officers stationed in the Florida Keys who are responsible for conducting criminal and civil investigations for violations within the Florida Keys National Wildlife Refuge Complex which includes:

- National Key Deer National Wildlife Refuge
- Crocodile Lake National Wildlife Refuge
- Great White Heron National Wildlife Refuge
- Key West National Wildlife Refuge

FKNMS and USFWS jointly manage 20 Wildlife Management Areas as part of the USFWS plan for managing backcountry portions of the Key West, Key Deer, Great White Heron, and

Crocodile Lake National Wildlife Refuges. The USFWS administers these areas including marking the areas with buoys and signs as appropriate, and USFWS-OLE patrols these areas maintaining sufficient presence to deter violations.

6. National Park Service

Law Enforcement with the National Park Service (NPS) is provided by Law Enforcement Rangers, Special Agents, and the United States Park Police. Jurisdiction is set by the enabling legislation for each individual unit of the NPS and is considered part of the Special Maritime and Territorial Jurisdiction of the United States. Law Enforcement on NPS lands with exclusive jurisdiction is solely conducted by NPS Law Enforcement Rangers or U.S. Park Police. Many NPS units have concurrent jurisdiction and share law enforcement authority with their state and/or local county law enforcement agencies. The primary focus of NPS Law Enforcement is the protection of natural resources, protection of NPS employees, and the protection of visitors.

The NPS has 31 enforcement officers stationed in South Florida who are responsible for conducting criminal and civil investigations for violations within the following areas adjacent to FKNMS:

- Biscayne National Park
- Everglades National Park
- Dry Tortugas National Park

7. Florida Fish and Wildlife Conservation Commission Division of Law Enforcement

The Florida Fish and Wildlife Conservation Commission Division of Law Enforcement's (FWC-LE) mission is to protect Florida's natural resources and people through proactive and responsive law enforcement services. The FWC-LE bases its patrol efforts on 4 core missions:

- Resource Protection
- Environmental Protection
- Boating and Waterways
- Public Safety

The FWC-LE represents a large part of the agency's personnel, with over 1,000 employees, over 800 of whom are sworn officers. In 2012, under direction of the Florida Legislature and Governor Scott, the FWC-LE was combined with the Department of Environmental Protection's Division of Law Enforcement and parts of the Department of Agriculture and Consumer Services' Office of Agricultural Law Enforcement, including the officers assigned to patrol state forests and the investigator responsible for commercial aquaculture violations. The FWC-LE also has cooperative agreements with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service where officers are cross-deputized to enforce federal marine fisheries and wildlife laws, thus ensuring state and federal consistency in resource-protection efforts.

The FWC-LE has six regions throughout the state are responsible for uniformed patrol and investigative law enforcement services of the FWC-LE's workforce. The officers and investigators protect fish, wildlife and the environment as well as Florida's residents and visitors. FWC-LE investigators are able to conduct both overt (uniform) and covert (plainclothes) investigations. The FWC-LE can target hard-core commercial violators by conducting long-term undercover investigations. Investigators are also responsible for inspecting personal and

commercial native and exotic wildlife facilities as well as investigating hunting and boating accidents and environmental crimes.

The FWC-LE also provides statewide coordination of all aviation, offshore vessel, K-9 and Special Operations Group activities. Aviation assets play a vital role in the agency's effort to enforce conservation and boating laws, protect endangered and threatened species and safeguard outdoor users. The division's offshore patrol vessels concentrate on offshore fisheries and protected marine areas as well as public safety. The K-9 teams are specially trained in tracking and wildlife detection. The K-9s receive no aggression training and are very "user-friendly." In addition to their law enforcement functions, they have proved to be a great community oriented policing relations tool.

The FWC-LE South Region has approximately 50 officers and administrative support personnel assigned to the Florida Keys. These officers and staff focus on supporting FWC-LE's core missions by educating the public and enforcing state and federal fisheries, wildlife, and environmental laws; protecting threatened and endangered species and habitats; managing captive and non-native wildlife; protecting state lands and water quality; investigating fish, wildlife, and environmental crimes; enforcing boating rules and regulations; managing public waters and access to them; conducting boating accident investigations; identifying and removing derelict vessels; and responding to natural and manmade disasters and search and rescue missions. (For more specific information about how FWC-LE directly contributes to sanctuary enforcement activities see the Joint Enforcement Agreement section.)

8. Monroe County Sheriff's Office

The Monroe County Sheriff's Office (MCSO) provides law enforcement service to all of the Florida Keys and their mission is to suppress, prevent, and deter crime with the relentless pursuit of all criminals as a top priority. The MCSO has state of the art detention facilities located in Stock Island, Marathon, and Plantation Key. The main administration building is also located on Stock Island, with patrol substations located on Cudjoe Key, Marathon, Islamorada, and Plantation Key. The MCSO has a fully equipped Special Weapons and Tactics Team, as well as a Dive Team, Bomb Squad, Marine Unit, Major Crime Investigations Unit, and Special Investigations Unit (specializing in drug investigations). The MCSO employs 544 personnel with 189 of those being road patrol officers and detectives, 139 Corrections Officers, 158 support personnel, and 58 personnel employed by the Sheriff's Office-managed High Intensity Drug Trafficking Area.

The MCSO Marine Enforcement Unit regularly performs vessel stops in area waters, checking boats for proper safety equipment, and checking to make sure the boater's catch is legal. There are currently seven boats assigned to various areas of the Keys, including two in the Lower Keys, one in Marathon, two in the Village of Islamorada and two in the Tavernier to Key Largo area of the Upper Keys. All of the boats were purchased using forfeiture funds - money derived from seizures made during the course of criminal investigations. The Sheriff's Office also uses Yamaha Waverunners, donated by Riva Yamaha and Key Largo Riva South. The watercraft are used for a variety of purposes, including search and rescue, boating safety programs, crime prevention patrols in county residential neighborhoods and assisting the Sheriff's Office Dive Team. The Marine Enforcement Unit's number one goal is the prevention of crime.

Enforcement Agreements and Funding

NOAA OLE has an established Cooperative Enforcement Program that aims to increase living marine resource conservation, endangered species protection, and critical habitat enforcement while strengthening state and territorial enforcement resources. Cooperative Enforcement Agreements between NOAA OLE and other state or U.S. territorial marine conservation law enforcement agencies provide the necessary authorizations for those officers to enforce federal laws and regulations.

A NOAA OLE and State of Florida Cooperative Enforcement Agreement authorizes FWC-LE officers to enforce state laws and other federal laws including the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), and Lacey Act and specific to FKNMS, FWC is authorized to enforce sanctuary specific regulations under the National Marine Sanctuary Act (NMSA) and Florida Keys National Marine Sanctuary and Protection Act (FKNMSPA). Enforcement of these regulations is conducted by a team of FWC-LE officers, NOAA OLE agents, USFWS-LE officers, and USCG personnel. Targeted partnerships and enforcement priorities are further outlined between specific agencies in annual Joint Enforcement Agreements.

Joint Enforcement Agreements

Each year FWC-LE receives funding from FKNMS through a Joint Enforcement Agreement (JEA), which is an overarching agreement between agencies that facilitates the operations, administration, and funding for FWC to enforce the federal laws and statutes set forth in the Cooperative Enforcement Agreement. The JEA includes a Division Enforcement Plan (DEP) that outlines the specific operational requirements necessary to carry out the provisions of the JEA and establishes those specific federal priorities that will be targeted for increased enforcement by FWC during the period of the JEA.

The 2014 JEA identified 11 enforcement priorities for which FWC-LE personnel conducted 7,538 personnel hours of at-sea patrols and 8,097 personnel hours of land based or dockside activities. At-sea personnel hours are divided among the following priorities:

- Tortugas Ecological Reserve
- Western and Eastern Sambo
- Sanctuary Preservation Areas / Research Only Areas
- Wildlife Management Areas
- Protected Wildlife
- Area to Be Avoided
- Coral / Live Rock Removal Injury Possession
- Grounding Responses
- Discharges / Deposits
- Historical / Cultural Resources

Funding for FWC-LE Joint Enforcement Agreement

Since 2000, FKNMS has provided almost \$16 million in support to the FWC-LE for officers and equipment, and continues to provide approximately \$1.5 million per year in resources to FWC for enforcement of FKNMS regulations. In addition to these funds provided by FKNMS, NOAA

OLE has provided the FWC-LE over \$13 million in support and continues to provide approximately \$1.2 million per year for the enforcement of federal fishery regulations throughout the State of Florida.

Through the JEA, FKNMS currently provides funding and/or in-kind support for the following: 1 supervisory Lieutenant, 5 officers, and one support personnel as shown below:

- Upper Keys: One officer.
- Lower Keys: One officer.
- Tortugas Patrol: An offshore patrol crew consisting of one Lieutenant in command with three additional officers. Patrols are conducted on board a 57 foot high performance catamaran vessel specifically designed for the task.
- 1 Duty Officer (dispatch center)
- 6 marked law enforcement vehicles
- 2 near shore patrol vessels with 2 additional vessels in reserve to ensure continuous operations.
- 1 long range patrol vessel
- Fuel and maintenance for all vessels and vehicles.
- Mechanics to maintain vessels and vehicles.
- Mess supplies for long range patrols.
- Travel for judicial proceedings.
- Office/meeting space in Key Largo and Key West.

In addition to the funds FKNMS provides to FWC-LE through the JEA, FKNMS allocates additional funding to support enforcement related activities including vessels, equipment, operations, and maintenance. FKNMS also provides mechanics to maintain enforcement vessels, a team to maintain buoys that mark zone boundaries, a team to conduct assessments of injuries to sanctuary resources, and a team to provide programs educating the public on FKNMS regulations and the significance of sanctuary resources.

Law Enforcement Program Current Activities and Accomplishments

NOAA and the State of Florida adopted the Florida Keys National Marine Sanctuary Management Plan in 2007. The 2007 management plan identifies one strategy associated with the Enforcement Action Plan, *Strategy B.6: Acquiring Additional Enforcement Personnel*, and sets forth specific guidance for achieving a number of goals and objectives to accomplish that strategy. Five activities, listed below, have been identified to (1) increase the presence of law enforcement officers on the water to protect resources and reduce user conflicts, (2) provide resources to aid officers in long-term investigations and (3) adequately staff enforcement of the Tortugas Ecological Reserve.

1. Develop Remote Observation Techniques to Aid Enforcement Efforts
2. Develop Interagency Agreements Establishing Cross-agency Enforcement Authority
3. Develop Standard Operating Procedures
4. Develop a Standardized Training Program
5. Develop System to Evaluate Effectiveness and Efficiency

1. Remote Observation Techniques to Aid Enforcement Efforts

The Atlantic States Marine Fisheries Commission's Law Enforcement Committee *Guidelines for Resource Managers on the Enforceability of Fishery Management Measures* identifies at-sea air patrols as a reasonable enforcement strategy when activities in a specific area are prohibited (ASMFC, 2002). Currently there is no NOAA aircraft presence for enforcement at any sanctuary (NOAA, 2010). FKNMS relies on support from FWC and the USCG, both active duty and auxiliary aircraft. However, due to the mission priorities of those agencies, aircraft are not often readily available for dedicated sanctuary enforcement patrols. Therefore FKNMS is evaluating the use of Unmanned Aircraft Systems (UAS) as a means to enhance enforcement capabilities to increase protection and conservation of sanctuary resources.

Current Actions

FKNMS has been working with NOAA's UAS program on a project utilizing a Low Altitude Short Endurance (LASE) Puma AE UAS (http://www.avinc.com/uas/small_uas/puma/) to meet multiple resource protection and management requirements of the ONMS. The project consists of five inter-related projects, in unique geographic areas, that maximize opportunities for multiple missions to evaluate the effectiveness of the UAS in supplementing management of marine protected areas. The primary missions consist of living marine resource (LMR) surveys, enforcement, high impact weather, and habitat mapping and characterization. These projects are conducted within the Channel Islands National Marine Sanctuary (CINMS), FKNMS, and Olympic Coast National Marine Sanctuary (OCNMS); all leading to a deployment to the remote Papahānaumokuākea Marine National Monument (PMNM) in the northwestern Hawaiian islands (NWHI). <http://www.kplu.org/post/feds-testing-drones-scientific-and-environmental-missions#.Udw1E6Cwbf0.email>

To date, FKNMS has supported two missions to test the applicability of UAS for both enforcement and resource management. In October 2012, the vessel Peter Gladding and crew along with NOAA personnel spent six days in the Dry Tortugas testing the Puma AE in support of law enforcement operations. The Puma AE is able to capture images, video, and has infrared capabilities. While in flight, the small aircraft Puma AE is stealthy and can barely be seen or heard and can be launched, operated, and recovered from small vessels. Officers noted that the aircraft is an effective supplement for law enforcement operations. During these test flights, capabilities to map corals, locate turtles, and track migrating birds were also demonstrated.

In September 2013, FKNMS conducted tests to evaluate the Puma AE's effectiveness while working from smaller vessel platforms in the near shore and remote back country areas of the Florida Keys. The team worked with partners from Everglades National Park (NPS), Florida Keys National Wildlife Refuges Complex (USFWS), United States Coast Guard (USCG), and Florida Park Service (FPS) to evaluate the systems effectiveness to support enforcement activities, conduct visitor use surveys, document bird populations, and detect Key Deer.

Future Actions

Additional UAS missions are planned for October of 2014 and will evaluate the applicability of UAS for conducting sea turtle surveys, vessel use pattern surveys, and benthic habitat mapping.

The ONMS and the NOAA UAS program will continue to evaluate the potential for using UAS to supplement on the water enforcement to enable officers, without being detected, to determine if a vessel is conducting prohibited activities. Utilizing a UAS, the enforcement vessel will be able to remain out of visual range and monitor activities being conducted by the subject vessel without providing them an opportunity to cease any prohibited activity. The UAS will also be able to assist with quantifying visitor use to determine if increased enforcement presence is needed to deter potential violations. While still in the testing phase, prior to routine use of UAS to supplement enforcement activity, consistent policy and procedures need to be developed.

2. Interagency Agreements Establishing Cross-agency Enforcement Authority

The first United States Coast Guard (USCG) – National Oceanic and Atmospheric Administration Cooperative Maritime Strategy was released in March, 2013. As stewards of the oceans, the USCG and NOAA are committed to safeguarding maritime interests while preparing for the future in a coordinated and efficient manner. This strategy provides the framework and intent that charts priorities for the future of the USCG-NOAA partnership and outlines joint objectives in the maritime domain over the next 10 years. It outlines three strategic priorities to guide the formal partnership: promote a safe and sustainable marine environment, enhance regional collaboration, and foster innovation in science, technology, and youth education.

Current Actions

In support of this strategy, FKNMS has been working with USCG Sector Key West, USCG Stations Islamorada, Marathon, and Key West, and USCG Auxiliary Flotilla and Air personnel to conduct dedicated patrols of Sanctuary Preservation Areas, Research Only Areas, Ecological Reserves, and Wildlife Management Areas. During Fiscal Year 2013, USCG Station Islamorada assets conducted 855 boardings during 1,310 patrols for a total of 7,026 personnel hours (1,756.5 vessel patrol hours) dedicated to protecting FKNMS resources. In February 2013, USCG Auxiliary Flotillas began weekly patrols of Sanctuary Preservation Areas and Research Only Areas between Tennessee and Carysfort Reefs in an effort to educate boaters, protect the coral reef environment, and promote boating safety. Auxiliarists are distributing educational packets containing charts and conservation information to boaters unfamiliar with sanctuary rules, and have the ability to contact Florida Fish and Wildlife Conservation Commission and USCG enforcement teams if necessary.

In April, 2013, USCG Auxiliary aircraft out of the lower keys began overflights covering all Sanctuary Preservation Areas. These flights are conducted in support of the USCG's Alien Migrant Interdiction and Living Marine Resource missions, but also support the FKNMS Enforcement Action Plan. During Fiscal Year 2013, USCG Auxiliary pilots conducted approximately 40 flights, totaling almost 147 hours of flight time and documented 486 commercial vessels and 1,198 recreational vessels using Sanctuary Preservation Areas.

The additional enforcement patrols by USCG and on-the-water outreach provided by Auxiliarists help maintain the integrity of sanctuary "no-take" areas and avert both accidental and intentional violations.

Future Actions

At-Sea Air patrols are a reasonable enforcement strategy when fishing in a specific area is prohibited. For closed areas to be effective and enforceable, they should meet the following criteria: have clearly defined areas; have regular shaped areas; be a large area; be closed to everything, with no exemptions (if transit is allowed, gear should be stowed); have a clear definition of when the area is closed; and be enforceable by aircraft or vessel monitoring system without need for boarding (ASMFC 2002). Many of the current marine zones within FKNMS meet these criteria. Continued support from both USCG and USCG auxiliary will allow FWC-LE officers to fly onboard USCG Auxiliary aircraft during their regularly scheduled flights. This will also provide a direct line of communication from officers in the aircraft to officers patrolling FKNMS by vessel.

FKNMS is also working with USCG and FWC-LE to conduct joint surface patrols utilizing vessels from FWC-LE and USCG Small Boat Stations in the near shore waters of the Florida Keys. Joint patrols may also be conducted from USCG Cutters operating out of USCG Sectors Key West and St. Petersburg to provide enforcement in remote areas of the sanctuary like the Dry Tortugas. Having FWC-LE personnel aboard USCG patrol vessels ensures that there are individuals onboard that are very familiar with FKNMS zones and regulations.

3. Standard Operating Procedures

The NOAA OLE Cooperative Enforcement Program provides clear and specific guidance for the JEA Program the sets forth program goals, priorities, and requirements; spending guidelines; agreement approval and evaluation criteria; and Federal and State agency rules and responsibilities. FKNMS also works closely with OLE, FWC-LE, and NOAA Office of General Counsel to ensure that enforcement activities are conducted in a manner that is consistent with agency policies and procedures.

Current Actions

Each year FKNMS, NOAA OLE, and FWC-LE prepare a Division Enforcement Plan (DEP) that sets forth the specific operational requirements necessary to carry out the provisions of the JEA. The DEP explains the methods by which compliance will be accomplished and serves as the day-to-day operational framework for the JEA. It contains the Federal enforcement priorities that will be targeted for increased enforcement by FWC during the year.

The DEP establishes monthly reporting criteria that includes all targeted enforcement activity at-sea and dockside hours; air patrol hours; administrative and clerical hours; outreach and education hours; the number of commercial, recreational, and/or headboat/tournament fishing

contacts, by fishery or fisher management plan; the number of inspections; and the number of enforcement actions, which include warnings, citations, and/or arrests, and summary settlements.

Through the issuance of permits, FKNMS can approve projects that would otherwise not be allowed because they are prohibited by sanctuary regulations. Permits may be issued for research, educational, archeological, or other projects which increase the scientific understanding or natural resource value of the sanctuary and its resources. Special conditions put in sanctuary permits ensure that approved projects are allowed to occur with minimal negative impact to the marine environment. One of these special conditions is a requirement that the permittee notify FKNMS and FWC-LE when they are conducting field activities. In an effort to simplify and streamline this notification process, FKNMS has provided permittees with a group email address where they can email the details of their activities. This email address includes representatives from FKNMS and FWC-LE who are then able to more effectively and efficiently distribute the information to enforcement officers in the field.

Future Actions

FKNMS will continue to work with NOAA OLE, USCG, and FWC-LE to identify and coordinate overall joint operations. NOAA OLE, USCG, and FWC-LE supervisors will coordinate routine joint operations and opportunities for targeted enforcement efforts. Maintaining this coordination and cooperation among agencies will increase communication, support efficient staff and equipment scheduling, standardize radio communications, and determine priority enforcement areas.

4. Standardized Training Program

In addition to standard training enforcement officers receive through their respective agencies, FKNMS has conducted training on sanctuary regulations and other federal or state natural and cultural resource laws.

Current Actions

FKNMS and Florida's Bureau of Archaeological Research staff have assisted in training by providing guidance to officers on how to deal with archaeological resource crimes and the role of law enforcement in managing and protecting cultural resources. Other topics that have been provided through targeted sanctuary training include federal case processing, federal evidence procedures, and the role of law enforcement in the Natural Resource Damage Assessment (NRDA) process.

Due to their participation in quarterly JEA meetings, USCG Gulf and Southeast Regional Training Centers have offered their assistance to provide additional fisheries specific training to FKNMS enforcement officers. FKNMS staff has also worked with the USCG training centers to provide updated regulatory and zoning information for inclusion in their training courses.

FKNMS staff has prepared a presentation on regulations and marine zones that should be included in the orientation briefing that personnel arriving at USCG Sector Key West units

receive. This briefing is intended to ensure that watch standers in the Command Center are familiar with FKNMS zones and regulations.

Future Actions

FKNMS staff will continue to provide training programs to personnel from all enforcement agencies in the Florida Keys on FKNMS regulations, zoning, enforcement, and emergency response in order to provide a better understanding of the complex regulations, marine zoning, and overlapping jurisdictions found in the Florida Keys. Future trainings may also include sessions on the Marine Mammal Protection and Endangered Species Acts. Additional opportunities to conduct joint training among and between agencies are being explored.

5. Evaluate Effectiveness and Efficiency

A system has been designed to evaluate the effectiveness of enforcement. Evaluating efficiency is done both monthly and annually. Managers assess efforts in known hot spots and coordinate enforcement coverage accordingly. On a yearly basis, the heads of the cooperating agencies meet to discuss issues.

Current Actions

FWC-LE provides monthly reports to FKNMS with the hours of at-sea and land based patrol associated with the priorities identified in the DEP. Reports from FWC-LE are a requirement of the JEA and allow management to ensure that FWC-LE is on track with meeting the contracted hour requirements of the JEA. Tracking these hours on a monthly basis provides the JEA partners up to date information on the allocation of hours used and allows for the redistribution of hours as necessary to account for changes in priorities without exceeding the overall allotment of hours.

In support of the USCG/NOAA Cooperative Maritime Strategy, USCG provides a monthly report of their hours of at-sea patrols as well as the number of missions and boardings conducted. Along with these reports, USCG also provides monthly updates on any significant enforcement actions and future plans that may include special targeted enforcement patrols.

On a quarterly basis, FKNMS managers meet with the FWC-LE Major, Captains, Lieutenant (Peter Gladding), and 5 officers, NOAA OLE Special Agent-in-Charge and two Special Agents, counsel from NOAA's GCES, and personnel from USCG Gulf and Southeast Regional Fisheries Training Centers, USCG District 7, USCG Sector Key West, and USCG Small Boat Stations, to discuss any necessary changes to agency policies or the enforcement priorities identified in the DEP. These meetings also allow the officers and other personnel who are out on the water to discuss the activities they witness on a day to day basis and begin planning for special targeted enforcement details if necessary.

Future Actions

Each year, managers with FKNMS, NOAA OLE, and FWC-LE will discuss, identify, and allocate hours for the next year's JEA enforcement priorities using feedback from the quarterly meetings and after discussions with other agency resource managers in the Florida Keys. Managers will also discuss any issues encountered during the previous year, and if not yet resolved, how these issues will be addressed.

FKNMS will continue to work with NOAA OLE, FWC-LE, and USCG to appraise and monitor enforcement operations to assure effectiveness and goal attainment. Managers will ensure that the implementation of policy and guidance is consistent; that the execution of the enforcement program is in compliance with laws regulations, policies, and procedures; that the program is effective in meeting goals and objectives; and that improvements in program execution are reviewed and corrective actions implemented to increase enforcement efficiency and effectiveness.

For more information

Atlantic States Marine Fisheries Commission (ASMFC). 2002. "Guidelines for Resource Managers on the Enforceability of Fishery Management Measures". ASMFC. Arlington, Virginia.

National Oceanic and Atmospheric Administration (NOAA). 2010. "Strategy for Clarifying Enforcement needs and testing Enforcement Measures". NOAA. Silver Spring, Maryland.

Appendix IV: Summary of Education and Outreach Activities

Background

Education continues to be identified as a significant need to help address resource management issues for the Florida Keys National Marine Sanctuary (FKNMS). During the Marine Zoning and Regulatory Review process, FKNMS received comments from the Florida Keys National Marine Sanctuary Advisory Council (advisory council), advisory council working groups, and the public indicating the need to increase education activities and the resources available to conduct targeted, innovative, and proactive education and outreach activities needed to ensure long-term success of the FKNMS program and its priorities.

Education and outreach have played a key role in resource protection since the 1975 designation of Key Largo National Marine Sanctuary. Over the decades, the sanctuary has worked to educate ever-growing and changing user groups about the Keys' resources and how to practice sustainable ways of enjoying those resources. Education is a crucial tool in managing these resources and reaching the people that use them. The purpose of this document is to provide information and additional resources on education and outreach programs currently in place at FKNMS.

The sanctuary's Education and Outreach Program is a collaborative effort by federal, state and local governments, elected officials, non-governmental organizations, academics, and local citizens. These groups are all dedicated to promoting education of the sanctuary ecosystem, ecology, water quality, habitats, fisheries and recreational opportunities.

Educating the diverse audience that lives in or visits the Florida Keys and uses or values the sanctuary in some fashion is challenging. The Florida Keys are home to over 75,000 permanent residents of which 8,300 are students in the public school system and a few small private schools. The Keys' host an estimated 3.5 million visitors annually equating to 13.3 million visitor days. From 2007 to 2008, approximately 400,000 individuals visited the sanctuary for fishing and 739,000 for diving (sanctuaries.noaa.gov/science/socioeconomic) equating to 2 million and 2.8 million person days respectively. In 2012, there were 26,461 vessels registered in Monroe County. With this large, diverse audience covering a wide geographical range and no single point of entry to the 2900 nm² sanctuary, the number of people utilizing sanctuary resources at any given time is constantly in flux. FKNMS management goals and strategies for education/outreach are constantly being improved upon to meet the needs of its audience.

Funding

While our audience increases, our resources to accommodate the education and outreach needs to meet the needs of this audience are decreasing. When the original Management Plan was implemented in 1997, \$5.2 million was the estimate to implement the education and outreach plan including 22 employees. In the 2007 Revised Management Plan, the implementation cost was estimated at \$4.2 million. Since 2009, there have been seven full-time employees dedicated to outreach and education efforts and the budget for supplies, materials and contracts has been approximately \$20,000 per year. However, all our staff contribute to and participate in the implementation of education activities.

Florida Keys National Marine Sanctuary Revised Management Plan, 2007

NOAA and the State of Florida adopted the Florida Keys National Marine Sanctuary Management Plan in 1997 and the revised plan in 2007. Both plans identified Education, Outreach & Stewardship as a management priority and included two action plans: Education and Outreach Action Plan and Volunteer Action Plan.

Education and Outreach Action Plan

The Education and Outreach Action Plan outlines management tools to reach key audiences, such as students or first-time visitors, with critical messages that enlist their support in protecting sanctuary resources. The objective of the Education and Outreach Action Plan is to deliver educational programs and products on environmental, natural, historical, cultural, and socio-economic issues, so that the public is able to base decisions and behavior on consistent, accurate scientific information.

The Goals of the Education and Outreach Action Plan are to:

1. Promote protection and sustainable use of Sanctuary resources;
2. Promote public understanding of marine resources, and related watersheds;
3. Promote public understanding of the National Marine Sanctuaries; and,
4. Empower citizens with the necessary knowledge to make informed decisions that lead to the responsible stewardship of aquatic ecosystems.

Volunteer Action Plan

The Volunteer Action Plan focuses on people volunteering and contributing time to help protect and conserve sanctuary resources. Successful sanctuary management relies on a well-informed public who understand their role in the overall management of the sanctuary. Volunteer efforts provide beneficial services and information to the Sanctuary as well as provide opportunities to increase a sense of stewardship among Florida Keys' constituencies.

The Goals of the Volunteer Action Plan are to:

1. Assist staff in accomplishing management objectives.
2. Build a stewardship ethic in the community

Education Programs & Activities Overview and Accomplishments

Since the Revised Management Plan in 2007, several new programs have been established, implemented, and expanded in the FKNMS for the sole purpose of educational outreach. Each of the following categories addresses a program or strategy for education/outreach. Each section includes information on the current actions taken to improve education throughout the sanctuary. Future plans for additional outreach are also highlighted.

Community Programs & Outreach:

1. Team OCEAN
2. Blue Star
3. Dolphin SMART
4. Blue Rider

5. Florida Keys Eco Discovery Center
6. Festivals & Events
7. Presentations to Community Groups
8. School Programs
9. Media
10. Technology: Social Media
11. Partnerships
12. Publications, Products, and Exhibits

1. Team O.C.E.A.N.

The Ocean Conservation Education Action Network, or Team O.C.E.A.N., program was established by the FKNMS in 1995 as a way for local volunteers to be involved and make a difference in the protection of FKNMS resources. Team OCEAN volunteers and staff work to promote safe and enjoyable public use of the marine environment and advocate protection of its natural resources.

On-the-Water: Trained volunteer teams using sanctuary owned vessels are stationed at heavily visited reef sites during the peak recreational boating seasons. They educate and inform the public about the FKNMS, and encourage proper use of sanctuary resources and basic safety precautions. Boat groundings frequently occur because boaters are unfamiliar with the water and with the need to navigate around reefs instead of motoring directly across the reef. Team OCEAN volunteers directly prevent groundings by being present, watching for errant boaters, waving them off when they attempt to cross the shallow reef crest, and providing educational material, local knowledge and charts to help familiarize new or visiting boaters with the sanctuary. Currently, the program has vessels operating from Key West, Bahia Honda and Key Largo. In 2014, Team OCEAN volunteers logged over 300 hours on the water and made contact with approximately 500 vessels.

Marine Debris Removal: Team OCEAN volunteers also participate in shoreline marine debris removal projects during the winter season. Events are organized at various locations throughout the Keys. Besides being unsightly, marine debris can endanger and harm birds, mammals, reptiles, and fish.. Since 2007, Team OCEAN staff and volunteers have removed over 38,000 lbs. of marine debris.

Business Community: Material Distribution & Relationship Building: Florida Keys local businesses have the opportunity to educate customers and make a positive impact on the protection of resources in the sanctuary. The economy of the Florida Keys is dependent on the natural and cultural resources of the sanctuary including hotels/motels, marinas, dive/snorkel shops, bait and tackle shops, parks, realtors, and rental boat companies.. Local businesses therefore have a vested interested in the health of the ecosystem. Staff regularly visit waterfront and visitor-related businesses in the Keys to serve as liaisons between the businesses and FKNMS management. These visits allow business owners to ask questions, share their views, and discuss any needs or issues. Also, to help increase the number of boaters who have access to sanctuary information, Team OCEAN staff distribute information packets containing sanctuary

information, charts and brochures on other helpful tips for navigating the sanctuary to rental-boat facilities throughout the Keys.

Boater Education Program: The number of registered boats in the Florida Keys and the number of visitors participating in boating activities has been on the rise. With a greater number of boaters on the water, the number of boating incidents and groundings in the area is also increasing, making education on boating safely even more important. Monroe County has approximately 27,100 registered vessels and the neighboring counties of Miami-Dade, Broward and Palm Beach have another 141,336 registered vessels (<http://myfwc.com/media/2804464/2013-BoatingStatistics.pdf>). Staff attend local festivals and other events with materials that provide the public with information about sanctuary resources and stewardship skills to enjoy these resources.

U.S. Coast Guard Auxiliary

On-the-Water: More than 350 individuals in the Florida Keys donate their time to the U.S. Coast Guard (USCG) Auxiliary, whose mission is to contribute to the safety and security of the nation's citizens, ports and waterways. Auxiliary members in marked vessels conduct patrols weekly to inform boaters about the sanctuary's special zones and rules, and promote boating safety. Complimenting Team OCEAN patrols, USCG Auxiliary members distribute educational packets containing charts and conservation information to boaters unfamiliar with sanctuary rules. The additional on-the-water outreach provided by the USCG Auxiliary helps in maintaining the integrity of sanctuary "no-take" areas and averting both accidental and intentional violations. In addition, they have the ability to contact FWC and USCG enforcement teams directly if necessary, providing added on-the-water authority.

Boater Safety: The USCG Auxiliary offers monthly Boating Skills and Seamanship (BS&S) Courses. FKNMS partners with USCG Auxiliary by providing guest lectures on sanctuary regulations and resource protection as related to boating during most classes held in Monroe County. This partnership allowed the sanctuary to reach more than 700 people who attended these classes in 2012. In the same year, the USCG completed over 1400 Vessel Inspections.

In the lower keys, the U.S. Power Squadron (USPS) offers additional boating safety courses and seminars. In 2012, FKNMS guest lecturers reached approximately 100 attendees at U.S. Power Squadron America's Boating Courses and USPS conducted 100 vessel inspections.

Future Actions

The advisory council reviewed and discussed boater education programs in Monroe County and the state of Florida at the August 20, 2013 advisory council meeting. At that time the following next steps were identified:

- The advisory council will form a subcommittee to engage with Florida Fish & Wildlife Conservation Commission Boating Advisory Council to:
 - Host a joint meeting / workshop

- Present Florida Keys National Marine Sanctuary boating and boating education issues to the Boating Advisory Council

Additional Information:

Team OCEAN: http://floridakeys.noaa.gov/volunteer_opportunities/teamocean.html

USCG Auxiliary (Division 13, District 7): <http://wow.uscgaux.info/content.php?unit=070-13>

U.S. Power Squadron website for Florida Keys: <http://www.usps.org/localusps/keywest/>

Eco-Mariner: <http://ecomariner.org/>

2. Blue Star

Blue Star is a program established by FKNMS recognizing tour operators who are committed to promoting responsible and sustainable diving and snorkeling practices to reduce the impact of these activities on coral reefs in the Florida Keys. Participation in the Blue Star program is completely voluntary, and the program involves no regulatory component. Blue Star operators are committed to responsible tourism and recognized for going the extra step to educate their customers about the coral reef ecosystem and cultural resources, the FKNMS, and diving and snorkeling etiquette. Blue Star Operators must meet environmental stewardship, continuing education, and evaluation criteria annually to maintain Blue Star status. Blue Star recognized operators are featured on the Blue Star web site, promoted via various marketing and outreach avenues - including print, television and radio - and receive regular communication from FKNMS, including the latest research and event news. The Blue Star Program has been funded in part by a grant awarded from Mote Marine Laboratory's Protect Our Reef Grants Program, which is funded by proceeds from the sale of the [Protect Our Reefs specialty license plate](#).

There are currently 17 participating Blue Star Operators. There are ten in the upper keys, three in the middle keys, and four in the lower keys. Updates can be found on the NMS's Blue Star website: <http://sanctuaries.noaa.gov/bluestar/operators.html>.

Future Actions

Over the next two years, the sanctuary will be partnering with local charter captains and guides, state and federal agencies (i.e. FWC, NOAA Fisheries), and non-profit recreational sport fishing groups to expand Blue Star to include charter sports fishers and charter fishing flats guides.

Additional Information:

Blue Star: <http://floridakeys.noaa.gov/onthewater/bluestar.html>

3. Dolphin SMART

Dolphin SMART is a program designed to reduce the disruption of wild dolphins by encouraging responsible viewing of these marine mammals. The program recognizes commercial wild dolphin tour operators who have made a commitment to educate their customers about the importance of minimizing wild dolphin harassment. Conservation agencies, including [NOAA's Office of National Marine Sanctuaries](#) and [National Marine Fisheries Service](#), [the Dolphin Ecology Project](#), and the [Whale and Dolphin Conservation](#), as well as local businesses and

members of the public, teamed up and developed the program Piloted in the Florida Keys in 2007, Dolphin SMART is a voluntary program that has now expanded to Hawaii, Alabama, and Southwest Florida. Participating businesses must meet the following program criteria: educate the public on the importance of responsibly viewing wild dolphins, participate in annual training, and undergo annual evaluations. In choosing to follow Dolphin SMART criteria, businesses demonstrate their support for dolphin conservation and can advertise the DolphinSMART logo. There is currently one participating operator in Key West (Fury Water Adventures)..

Future Actions

While the program in the Florida Keys has focused on operators in the Key West area, eco-tours and other businesses in the upper and middle Keys will be encouraged to participate in the program. There are resident pods of dolphins on the bayside of the upper Keys along with areas where manatees congregate in the winter months that would benefit from operators participating in this program.

Additional Information:

FKNMS Dolphin SMART website: <http://floridakeys.noaa.gov/onthewater/dolphinmart.html>

NOAA Dolphin SMART website: <http://www.noaa.gov/features/economic/smartdolphin.html>

4. Blue Rider

The Blue Rider Ocean Awareness and Stewardship Program was established in December 2009 by FKNMS and the Personal Watercraft Industry Association (PWIA). It is currently managed by the National Marine Manufacturers Association (NMMA) as a voluntary program that recognizes operators and riders who rent PWCs in the Florida Keys who understand, embrace, and practice good ocean environmental stewardship when riding in FKNMS. Participating businesses are given "Best Practices" that minimize their fleet's environmental footprint to incorporate into their customer orientation. Best practices include instructing renters not to harass, pursue, touch, feed or disturb wild dolphins, manatees or sea turtles and emphasizing that careless and reckless boating behavior that endangers the safety of swimmers and boaters is not tolerated. By promoting these "Best Practices" business owners can help ensure that their customers leave not only enthused about their PWC excursion, but also more appreciative of the sensitive marine habitat that they toured.

There are currently 13 participating Blue Rider Operators. There are three in the upper keys (one operator has 4 locations), one in the middle keys, and nine in the lower keys.

Additional Information:

Blue Rider: <http://www.pwia.org/bluerider/default.aspx>

5. Florida Keys Eco-Discovery Center

Educational programs and exhibits at the Florida Keys Eco-Discovery Center deliver messages of ocean conservation and protection to people from around the world. Located in Key West with no entrance fees, the Center has hosted more than 70,000 visitors since opening in January 2007.

Attendance set a calendar-year record of 74,864 total visitors in 2013. Average daily visitation for the year was 284, with the highest single-day attendance surpassing 4,000 visitors. A total of more than 1,300 school children toured the Center on organized school field trips that same year.

The Center itself features over 6,000 square feet of interactive and dynamic exhibits. Included is a mock-up of Aquarius, the world's only underwater ocean laboratory, which offers glimpses of the beautiful marine life at the reef and shows how scientists live beneath the sea during research expeditions. Other displays highlight the coral reef environment, such as Mote Marine Laboratory's Living Reef exhibit, which includes a 2,500-gallon reef tank with living corals and tropical fish. A short film on the diverse ecosystem of the Florida Keys by renowned filmmaker Bob Talbot called "Reflections of the Florida Keys" can be viewed at the center's theater. In 2010, a new exhibit, dedicated to climate change and renewable energy was installed. The exhibit kiosk included access to a website displaying real-time energy generated by the more than 200 photovoltaic panels installed on the Center's roof, as well as the carbon offsets of the energy generated. The Eco-Discovery Center's conference room is also a highly popular venue. Almost 9,000 people attended tours, seminars, workshops and meetings held at the Eco-Discovery Center in 2013.

The Eco-Discovery Center also provides additional opportunity for volunteers to educate the public on the sanctuary's behalf. The Eco-Discovery Center relies on its volunteers to educate visitors about the displays in the center and the ecosystems that these displays represent. Volunteers typically serve as greeters for visitors entering the center, docents stationed around the center, and assistants for activities such as kids' events.

Managed and operated by NOAA/FKNMS, the Center is supported by U.S. Fish and Wildlife Service, Everglades and Dry Tortugas National Parks, South Florida Water Management Division, Mote Marine Laboratory, National Wildlife Refuges of the Florida Keys, and Eastern National.

Additional Information:

http://floridakeys.noaa.gov/eco_discovery.html

6. Festivals and Events

FKNMS often partners with FWC Division of Law Enforcement to attend and exhibit at local festivals and other events with materials that provide the public with information about sanctuary natural and cultural resources. As partners, the sanctuary and FAC Staff answer questions and provide information on the resources, zones, how to use mooring buoys, rules and regulations, and science being conducted. . Besides offering charts and brochures to visiting boaters, staff provides fun activities such as button-making and fish-measuring games for kids. In 2013, FKNMS staff interacted with over 6,000 people with an estimated exposure to over 50,000 visitors at these events including Conch Fest, John Pennekamp Coral Reef State Park Native Plant Day, Marathon Seafood Festival, Key Largo Stone Crab and Seafood Festival, Upper Keys Rotary Gigantic Nautical Flea Market, Florida Keys Seafood Festival (Key West), Big Pine Key Seafood Spectacular, Florida Keys Community College Community Day, Mote Ocean Fest, Earth Day 5K, Bahia Honda Earth Day, and Ocean Reef Safe Boating Day

Festival Highlights: Mote Marine Laboratory's Annual Ocean Festival is hosted by the Florida Keys Eco-Discovery Center in Key West. This event focuses on enhancing the appreciation and conservation of our local marine environment and features local artists and musicians. The fifth annual Ocean Fest was held on March 29, 2014 with approximately 8,000 attendees visiting more than 75 educational booths, exhibits and interpretative displays. Families and children took part in fun and educational activities ranging from "ethical angling" fishing clinics to making buttons of their favorite sanctuary sea creatures. More than 3,700 of the attendees passed through the doors of the Florida Keys Eco-Discovery Center, making it the second-highest single-day attendance in the facility's history.

Every year, the sanctuary partners with FWC prior to the opening of lobster season to educate residents and visitors alike on the various state, federal and local jurisdictions rules. A multi-agency information booth at MM106 in Key Largo attracts visiting fishermen for the five consecutive days prior to the start of lobster sport season. Sanctuary and FWC staff provide information on the proper techniques for catching and measuring lobsters, and explain the sanctuary no-take areas and other resource-protection regulations. In 2013, staff logged over 700 interactions with visitors to the booth. The sanctuary also produces and prints 55,000 copies of the *Monroe County Recreational Lobster Regulations Brochure* and distribute them throughout the County (not including online digital downloads). This additional educational effort targeted on lobster regulations is an important tool to increase the public's knowledge of the regulations to increase compliance and mitigate the potential negative effects intense lobster fishing can have on the ecosystem.

Additional Information:

http://floridakeys.noaa.gov/visitor_information/events.html?s=visit

7. Presentations to Community Groups

In addition to participating in local festivals and events, sanctuary staff provide outreach on cultural and natural resources and stewardship skills through presentations in the community including staff training for Boy Scouts of America National High Adventure Sea Base and Newfound Harbor Marine Institute (Seacamp), Lionfish Safe Collection and Handling Workshops, and weekly during the winter months at John Pennekamp Coral Reef State Park.

Maritime Heritage: Specific education and outreach efforts on the historical and cultural resources are also conducted. The *Shipwreck Trail* was created to increase public awareness about the diversity, importance and educational value of historical resources within FKNMS. The nine sites on the trail are representative of the broad periods of Keys' maritime history: European Colonial, American and Modern. Historical information and archaeology on the trail can be found on the sanctuary's website and are accompanied by printable site plans that map the wreck on the seafloor. While information on the Shipwreck trail and other maritime resources are included in all presentation staff are frequently requested to focus on the historical resources.

In partnership with the Mel Fisher Maritime Museum an annual Maritime Heritage Symposium is offered for the community to listen, learn and engage in current research and findings related.

Each year the sanctuary partners with the Florida Public Archaeology Network (FPAN) and Florida Bureau of Archeological Research (BAR) to offer a Heritage Awareness Diving Seminar (HADS). The three day seminar provides SCUBA course directors, instructor trainers and instructors with a greater knowledge of how to proactively protect shipwrecks, artificial reefs, and other underwater cultural sites. Upon completion of the seminar, they are able to teach the Heritage Awareness Specialty Course (approved by NAUI, PADI, and SSI) and will know how to promote sustainable underwater heritage tourism in their area.

8. School Programs

Custom programs for school groups from voluntary pre-kindergarten through college age students are scheduled per request. Monroe County schools and visiting schools can request classroom visits, guest lectures, field experiences, teacher workshops, science nights, and career fairs.

Staff support and participate in science education events for pre-kindergarten, elementary, and middle school students such as Stanley Switlik School's Science Expo Day; Plantation Key School's Marine Science Day, and Florida International University's Science Nights at schools in the upper Keys. Serving as science fair judges at the middle, high school and county level, and participating in career days are other ways to contribute..

Once a month, the Florida Key's Eco-Discovery Center hosts *Discovery Saturday, an educational program for grade school students*. It is attended by more than 150 children who participate in games, crafts and other fun activities while learning about the sanctuary and the Florida Keys' unique marine environment.

The Monroe County Middle School Envirothon is an annual competition organized and funded by the Monroe County Environmental Education Advisory Council (MCEEAC) and organized by sanctuary staff. Teams of students rotate through science stations, answering questions and testing their knowledge of the local environment and environmental issues. The stations are hosted by Keys' local, state and federal agencies and environmental organizations.

In partnership with the Florida Keys Community College, FKNMS offer a six-week, non-credit course titled "Sanctuary Seminar Series." Two-hour evening seminars by subject matter experts on issues of interest related to scientific research, ecological topics, marine area management and maritime heritage at Florida Keys Eco-Discovery Center in Key West. Established in 2008, this popular course quickly fills and attendees range from high school students to retirees.

9. Media

FKNMS uses both traditional of print and radio along with social media to reach a wide variety of audiences. Press releases, announcements, calendar postings, guest articles and subject matter expert reviews are provided to local, regional and national publications of newspapers, magazines, and newsletters. Local radio stations provide opportunities for sanctuary staff to participate in weekly, bi-weekly or as special guests in their programming. In 2013, more than 200 reporters contacted the sanctuary for information, images and assistance.

Waterways TV—*Waterways TV* series is a joint project between FKNMS, Everglades National Park, and the U.S. Environmental Protection Agency to inform viewers of the diverse wonders of the south Florida ecosystem and the research and conservation programs that protect them. The series airs on public and government channels throughout the state of Florida. It can be viewed locally on Monroe County Channel 76 (Saturday's at 9:00 AM) and WEYW Channel 19 (Saturday's at 6:00 PM) as well as an additional 35 Florida public access channels (municipality, university, govt.) Over 200 episodes have been produced in the last 15 years. Over 3 million viewers have direct access to the series as it is broadcast. Episodes are also available on DVD (Monroe County libraries) and can be viewed on YouTube: www.youtube.com/WaterwaysTVShow.

10. Technology: Social Media

Easily accessible on a global scale, social media has become an increasingly important platform for providing information to the public. FKNMS has joined several popular social media avenues such as Facebook, Twitter, and Pinterest to improve information flow to all users of the sanctuary.

FKNMS Website <http://floridakeys.noaa.gov>

The FKNMS website includes comprehensive information on sanctuary science, history, maritime heritage, programs, management, current events, volunteer activities, Advisory Council activities, and more. In early 2014, a study was conducted on the FKNMS website user-statistics. Over a span of eight months, the website had a total of 136,000 visits with about 5 times as many new visitors versus returning user. The majority of visitors were routed through search engines using key words: “corals, mangroves, maps, shipwrecks, and Looe.” The most popular pages were: *Florida Keys Eco-Discovery Center*, *Visit the Sanctuary*, *About Your Sanctuary*, *Explore the Sanctuary*, and *Marine Zones*. Other popular searches within the website included: “Coral, Water Quality, Regulations, Mangroves, Looe Key, Mooring Buoys, and Artificial Reefs.” The most popular downloads on sanctuary regulations included the Lobster Brochure, Spearfishing Brochure, and the Science Summaries.

Facebook <http://www.facebook.com/floridakeysnoagov>

Social media is another tool that is used to reach the diverse audience within the Keys and beyond at a minimal cost of time and resources. The FKNMS Facebook page reaches another social network audience with postings of current sanctuary events, activities, stewardship skills and science facts. This popular media tool gives users access to real-time information on what is happening within the sanctuary. In newsfeed format, interesting facts and visually stunning photos help stimulate interest and maintain enthusiasm for the Florida Keys. Facebook is a tool to stimulate public conversation and two-way information flow. Followers of the FKNMS Facebook page have the ability to provide feedback and share information extending audience reach even further. Launched in December 2010, the FKNMS Facebook page has received 24,822 likes as of September 9, 2014. The “highest daily total reach” was 77,249. By using the insight information collected by Facebook, staff are able to track the audience and the reach of the different posts.

Twitter <http://twitter.com/FloridaKeysNMS>

Twitter is another real time online social networking tool that provides public a point of access to key information on sanctuary news. It is a microblog that can be easily accessed online or through mobile devices via the twitter app.

11. Partnerships

The Florida Keys National Marine Sanctuary could not be managed effectively without its wide network of partnering agencies, organizations and community members. Several of these partnerships have been mentioned previously in this report—a testament to their integral role in public education and outreach. The multitude of partners cannot easily be captured in a simple list as the range of partners are many and broad that are dedicated to public education/outreach on FKNMS rules, regulations, and management.

12. Publications, Products, and Exhibits:

Science and Management Publications: The diverse habitats and marine life of FKNMS have been studied and documented by researchers to better understand the health of the sanctuary, its threats, and our role in its protection. The following publications are produced by the sanctuary, NOAA, and partner agencies to provide information on the health of the Florida Keys ecosystem and management strategies to conserve it.

- Condition Report 2011 for Florida Keys National Marine Sanctuary
- Science Summaries
- Marine Zone Monitoring Publications
- Marine Sanctuaries Conservation Series Reports
- The State of the Coral Reef Ecosystems of the Florida Keys
- Florida Keys National Marine Sanctuary Comprehensive Science Plan
- Florida Keys National Marine Sanctuary Science Needs
- Florida Keys Species List

Links to sanctuary-produced publications can be found on the FKNMS website:

<http://floridakeys.noaa.gov/scipublications/>

Products: In addition to producing formal publications, FKNMS provides numerous products to educate the public on the science of the sanctuary, sanctuary regulations, and best practices. These include charts, posters, and brochures for the general public. These products are distributed gratis to partner agencies, state parks, dive shops, fish/tackle stops, eco-tourism agencies, ECT. They are also available at the sanctuary offices, the Florida Keys Eco-Discovery Center, and at events the sanctuary participates in.

Exhibits: In addition to the Florida Keys Eco Discovery Center, sanctuary exhibits are on display in public locations through the Keys. These include a 1700s cannon with four-panel exhibit at the Key Largo Chamber of Commerce, a prominent display at the John Pennekamp Coral Reef State Park visitor center, and boat ramp signs in 43 locations throughout Monroe County and southern Miami-Dade County.

Appendix V: Protocol for Cooperative Fisheries Management

The Protocol for Cooperative Fisheries Management directly relates to the future management and regulation of fishing activities in the FKNMS.

I. Problems

1. Separate regulations developed by the State of Florida, the South Atlantic Fishery Management Council (SAFMC) and the Gulf of Mexico Fishery Management Council (GMFMC) exist within the Florida Keys National Marine Sanctuary (Keys Sanctuary).

2. The existence of inconsistent State and Federal regulations makes it difficult to coordinate, implement and enforce management measures and may lead to overfishing. Inconsistent management measures create public confusion and hinder voluntary compliance.

II. Objectives

1. Develop consistent (or one set of) regulations within the Keys Sanctuary.

2. Provide for a flexible management system that minimizes regulatory delays while retaining substantial State, Federal and public involvement in management decisions, and rapidly adapts to changes in resource abundance, new scientific information and changes in fishing patterns among user groups.

3. Promote public comprehension of, voluntary compliance with and effective enforcement of the fisheries regulations within the Keys Sanctuary.

III. Protocol

The Florida Marine Fisheries Commission (FMFC), the SAFMC and GMFMC (Councils), the National Marine Fisheries Service (NMFS), and the National Ocean Service (NOS) hereby adopt the following protocol which describes the roles of the Federal and State governments in the ongoing management of the fishery resources of the Florida Keys National Marine Sanctuary (Keys Sanctuary):

1. The FMFC, Councils, NMFS and NOS acknowledge that the Florida Keys National Marine Sanctuary (Keys Sanctuary) comprises approximately 65% Florida state waters and 35% Federal Economic Exclusive Zone waters. The convergence of three jurisdictions within the Keys Sanctuary caused numerous regulatory and enforcement problems in marine resources management. The situation calls for unified and cooperative State-Federal management consistent with the Congressional intent in the Sanctuary designation.

2. The FMFC, Councils, NMFS and NOS acknowledge that they share the responsibility of managing the fisheries and fishery habitats within the Keys Sanctuary to increase long-term yields, to prevent depletion and provide for enhancement of the stocks, to ensure conservation of fishery resources and habitats, and to further the goals and objectives of the Sanctuary designation, including the purposes, policies and objectives listed under section 301 of the National Marine Sanctuaries Act (NMSA), and sections 2, 3, 7 and 8 of the Florida Keys National Marine Sanctuary and Protection Act.

3. The FMFC will serve generally as the lead agency for purposes of initiating, developing and implementing ongoing marine fishery regulations for the Keys Sanctuary in accordance with this Protocol and the procedures established herein. The Councils, NMFS or NOS also may initiate regulatory action for the Sanctuary through cooperation with the FMFC under this Protocol and its procedures, and in accordance with the comprehensive management plan for the Keys Sanctuary.

4. The rulemaking standards which govern the FMFC (Section 370.025, Florida Statutes) are consistent with the goals of the Sanctuary designation, and the administrative procedures governing FMFC rulemaking (Chapter 120, Florida Statutes) are comparable to those of the Federal Administrative Procedures Act. Utilizing these state rulemaking standards and procedures in accordance with this Protocol, the FMFC will ensure opportunities for full public participation in developing or modifying fishery rules for the Sanctuary and in Governor and Cabinet proceedings to approve FMFC rules.

5. The FMFC, Councils, NMFS and NOS acknowledge and agree that rules developed under this Protocol shall be consistent with the goals and objectives of the comprehensive management plan for the Keys Sanctuary, the NMSA and other applicable federal law, utilizing as guidance the national standards of section 301(a) of the Magnuson Act to the extent such standards are consistent with the goals and objectives of the Sanctuary designation.

6. Fishery rules developed under this Protocol for all or portions of the Sanctuary area generally will be adopted as Sanctuary regulations in accordance with Federal rulemaking procedure and the comprehensive management plan for the Keys Sanctuary. This Protocol may be adopted as an amendment to applicable fishery management plans.

7. The FMFC will have responsibility for developing and collating the supporting information for Sanctuary fishery rules, with assistance, as needed, from NMFS and NOS. Specifically, the FMFC will provide to the NOS, and as appropriate, to the Councils and NMFS, written explanations of its decisions related to each of the rules (including a statement of objectives of the proposed rulemaking, how the rule will accomplish the stated objectives, how the rule will further the goals and objectives of the Sanctuary management plan, and how interested parties were involved in the rulemaking), summaries of public comments, biological, economic and social analyses of the impacts of the proposed rule and alternatives, and such other information that is relevant and necessary for review purposes.

8. The Councils, NMFS, and NOS shall have the right to fully participate in FMFC rulemaking proceedings for Sanctuary fishery regulations, including the right to attend all relevant meetings (both formal and informal) and to actively participate in discussion and debate relating to the proposed rule(s). The FMFC agrees to provide each with full record documentation of each rule proposed for the Sanctuary as necessary to facilitate such participation. Where practicable, the FMFC further agrees to coordinate the effective date of such regulations promulgated by the State so as to coincide with the beginning of the calendar year.

IV. Procedure

The following procedure may be utilized for the initiation, development and implementation of fishery regulations for the Keys Sanctuary in accordance with the above Protocol for Cooperative Fishery Management:

1. The FMFC may initiate a coordinated rulemaking process by drafting a proposed fishery rule for the Keys Sanctuary. The FMFC shall provide such draft rule to NOS, NMFS and the Councils at the earliest practicable time in the rulemaking process. Through a process of informal consultation on the draft rule, the parties shall determine how best to proceed (i.e., through state rulemaking, Federal rulemaking, or a combined State-Federal rulemaking process). Early, informal consultation also may be used to determine whether significant involvement or action by the Councils will be necessary. Any tentative consensus reached at this stage of informal consultation shall not bind the parties for purposes of subsequent review and approval under this Protocol.

2. The Councils, NMFS or NOS also may initiate rulemaking by developing a draft rule and initiating informal consultation in a manner similar to paragraph 1 above. In such cases, the FMFC will be afforded a reasonable opportunity to propose companion state fishery regulations or to propose conforming modifications to existing state fishery regulations. Through consultation, the parties shall seek to coordinate rulemaking processes, development of the administrative record, policy, legal and technical reviews, effective dates and implementation. In cases where only federal regulations are proposed, the FMFC shall assist as appropriate in developing the administrative record and cooperate in submitting the proposed Sanctuary regulations for the conceptual approval of the Governor and Cabinet.

3. The FMFC, shall develop a record of supporting information and analysis for proposed Sanctuary regulations, with assistance, as needed, by NMFS and NOS. Such record, at a minimum, shall include: a background statement regarding the objectives of the proposed rule; an analysis of how the proposed rule will accomplish the stated objectives; an analysis of how the proposed rule will further the goals and objectives of the Sanctuary management plan; a statement of how interested parties are involved in the rulemaking process; summaries of public comments; biological, economic and social analyses of the impacts of the proposed rule and alternatives; and such other information that is relevant for review purposes.

4. At the earliest practicable time, the FMFC shall transmit the record of supporting information and analysis developed pursuant to paragraph 3 above to NOS, and for species that the Council(s) manage, or for which NOS requests transmittal, the FMFC shall concurrently transmit such record to the relevant Council(s) and NMFS. The Council(s), upon receipt of relevant biological or statistical information from the FMFC, NOS or both, may refer such information to appropriate scientific and statistical committees and advisory panels for their advice. As necessary and appropriate to expedite coordination between the parties, an incomplete record may be transmitted for consultation and preliminary review, to be supplemented as information becomes available.

5. As soon as practicable following transmittal of the record pursuant to paragraph 4 above, NOS shall grant or deny preliminary approval of the proposed regulations based on a preliminary determination of consistency with the comprehensive management plan for the Keys Sanctuary, and with the goals and objectives of the NMSA. Concurrently, for proposed regulations transmitted for review by the Council(s), the Council(s) also shall make a preliminary determination of consistency with the management plan for the Keys Sanctuary, using the Magnuson Act national standards as guidance, and may either grant or deny preliminary concurrence in the proposed regulations. Such preliminary determinations by NOS and the Councils shall be subject to final approval (and concurrence) following a "final public hearing" under Chapter 120, Florida Statutes.

6. Immediately following such preliminary approval (and preliminary concurrence), the Council(s) will prepare the proposed rule in the form of a draft Federal rule for the Sanctuary, in accordance with section 304(b)(5) of the NMSA. The Council(s) may elect to refer to NMFS (or in some cases NOS) the task of preparing the draft Federal rule.

7. Following preliminary approval by NOS (and concurrence of the Council(s)), the FMFC shall conduct a "final public hearing" in accordance with Chapter 120, Florida Statutes. The Councils, NMFS, and NOS may participate in both the final hearing and FMFC discussions relating to development of the final draft of the proposed rule. If preliminary approval (and/or concurrence) pursuant to paragraph 5 above is not granted or denied within a reasonable period of time following transmittal of the record pursuant to paragraph 4 above, or in any case involving a resource emergency, the FMFC may proceed to a final public hearing barring subsequent disapproval by NOS (and/or the Councils).

8. Concurrent with notification of the final public hearing under the State rulemaking procedure, NOS (in cooperation with NMFS) generally shall initiate a Federal (notice and comment) rulemaking process for the proposed Federal rule. Federal rulemaking shall be initiated by publication in the Federal Register. If required by exceptional circumstances, the Federal rulemaking process may be deferred until after the final public hearing by the State and approval by the Federal parties as provided for under paragraph 9 below.

9. After the final public hearing, NOS shall conduct a final review of the entire administrative record and, within a reasonable time following the final public hearing, shall either grant or deny its final approval of the proposed rule. The Council(s) also may conduct a final review, in order to make a final determination regarding consistency with the management plan for the Keys Sanctuary, using the Magnuson Act national standards as guidance, and may either grant or deny concurrence within a reasonable time, not exceeding 60 days, following the final public hearing. In cases where the Council(s) granted preliminary concurrence and no material change results from the final public review, or where final concurrence is not granted or denied within a reasonable time, the final concurrence of the Council(s) will be deemed automatic without further Council action.

10. In cases where Federal rulemaking is deferred until after the Chapter 120, Florida Statutes process is completed, the NOS (in cooperation with NMFS) shall initiate Federal (notice and comment) rulemaking based on the entire administrative record by publishing a proposed Federal rule in the Federal Register.

11. If substantially differing comments result from the Federal and State public review processes requiring changes that would produce material differences between the Federal or State proposed rules, any one of the previously reviewing parties may request an opportunity to review the proposed changes and determine whether it will be necessary to alter or amend its previous determination(s), and/or whether it will be necessary to repeat any of the preceding procedural steps (thereby initiating a "feedback loop"). Any such request and determination shall be made within a reasonable time, not exceeding 60 days, following completion of the Federal and State public review processes and prior to submission to the Governor and Cabinet or publication of final Federal regulations.

12. Following completion of the final public review and final approval by NOS (and the Council(s)), the FMFC shall submit the proposed rule for an "up" or "down" vote by the Governor and Cabinet. In cases that do not involve State regulatory changes, the proposed Sanctuary regulations shall be submitted to the Governor and Cabinet for "conceptual approval" in accordance with the comprehensive management plan for the Keys Sanctuary and applicable National Oceanic and Atmospheric Administration - State Memoranda of Agreement.

13. Federal fishery regulations for the Keys Sanctuary developed in accordance with this Protocol shall be published as final Sanctuary regulations pursuant to the NMSA. Enforcement of existing or new Federal fishery regulations for the Keys Sanctuary shall be conducted in accordance with a cooperative arrangement entered into between relevant State and Federal enforcement agencies.

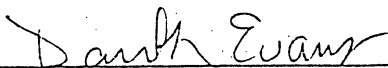
V. Signatories



Executive Director
Florida Marine Fisheries Commission

1/25/98

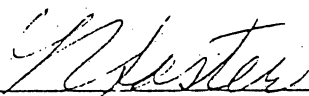
Date

* 

National Marine Fisheries Service

11/25/97

Date


National Ocean Service

9/17/97
Date

*The signature of a National Marine Fisheries Services representative, acting as a designee of the Secretary of Commerce, is provided based on the recommendations of the Gulf of Mexico and South Atlantic Fishery Management Councils, and operates as the Councils' endorsement. The Councils were established by the Magnuson-Stevens Act, 16 U.S.C. 1801, et seq., to develop management plans for domestic fisheries of the United States. Under the National Marine Sanctuaries Act, specially 16 U.S.C. 1434 (a) (5), the Councils are also authorized to make recommendations for sanctuary regulations. The Councils' recommendations are subject to the approval of the Secretary of Commerce.

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