Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

Gray's Reef
National Marine Sanctuary

Draft Management Plan
Draft Environmental Assessment

National Oceanic and
Atmospheric Administration

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Cover Photo:
Gray's Reef National Marine Sanctuary seascape with diver
Greg McFall/Gray's Reef National Marine Sanctuary

About this document

A sanctuary management plan is a site-specific planning and management document that describes the goals, objectives, and management activities for a national marine sanctuary. This document is a combined draft management plan as well as a draft environmental assessment for the National Oceanic and Atmospheric Administration (NOAA) Gray's Reef National Marine Sanctuary (GRNMS). The plan and assessment are the result of the Office of National Marine Sanctuaries' (ONMS) review of the strategies and activities detailed in the 2006 Final Management Plan and the emerging resource protection issues for GRNMS. A management plan review is conducted at a sanctuary periodically in accordance with the National Marine Sanctuaries Act (NMSA; 16 USC 1431 *et seq.*).

The management plan, when finalized, will serve as the primary management document for GRNMS for approximately the next five to ten years.

The draft environmental assessment is prepared in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 USC § 4321 *et seq.*) as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and NOAA Administrative Order (NAO) 216-6, which describes NOAA policies, requirements, and procedures for implementing NEPA.

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Executive Summary

The National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) is proposing to revise the 2006 Gray's Reef National Marine Sanctuary (GRNMS or sanctuary) Management Plan and to make minor changes to the existing GRNMS regulations.

The bulk of this document is the proposed revised GRNMS Management Plan. The objectives and activities in the revised plan are derived from the sanctuary vision, mission and goals, evaluation of the 2006 management plan, public scoping, current resource conditions and trends, protection issues, implementation of the research area, new technologies and emerging issues, and public awareness needs. Throughout the process, considerable discussion with and recommendations received from the GRNMS Sanctuary Advisory Council set the framework for the plan.

Chapter 1 introduces the jurisdictional framework of the sanctuary as well as the vision, mission and goals for the sanctuary.

Chapter 2 is the draft management plan, which is focused on the following three themes:

- Maintain or Improve the Condition of all Sanctuary Resources
- Increase the Awareness of, and Support for, GRNMS
- Advance Collaborative and Coordinated Management

Chapter 3 is the draft environmental assessment, prepared to fulfill requirements of the National Environmental Policy Act of 1969 (NEPA; 42 USC § 4321 *et seq.*). The environmental assessment includes the purpose and need for the proposed action, descriptions of the natural resources and environment of GRNMS, alternatives considered for the proposed action, and an analysis of the environmental consequences of the proposed action in relation to sanctuary resources and the environment.

The primary regulatory change proposed would allow the use of weighted marker buoys for diving safety and fishing convenience in the sanctuary. The other regulatory change is a clarification to the existing anchoring regulation. NOAA proposes to add "…or attempting to anchor" to the prohibition. The regulations are proposed in a separate rule and analyzed in Chapter 3.

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Acronyms

GADNR – Georgia Department of Natural Resources
GADNR LE – GADNR Law Enforcement
GCES – General Counsel Enforcement Section
GRNMS – Gray's Reef National Marine Sanctuary
NCCOS – NOAA National Centers for Coastal Ocean Science
NDBC – NOAA National Data Buoy Center
NEPA – National Environmental Policy Act
NMFS – NOAA National Marine Fisheries Service (also known as NOAA Fisheries Service)
NMSA – National Marine Sanctuaries Act
NMSP – National Marine Sanctuary Program (now ONMS)
NMSS – National Marine Sanctuary System
NOAA – National Oceanic and Atmospheric Administration
NOAA OLE – NOAA Office of Law Enforcement
NOS – NOAA National Ocean Service
ONMS – NOAA Office of National Marine Sanctuaries (formerly the National Marine Sanctuary Program (NMSP)
SAB – South Atlantic Bight
SAFMC – South Atlantic Fishery Management Council
SkIO – Skidaway Institute of Oceanography (part of the University of Georgia)

Glossary

Benthic – occurring at the bottom of a body of water
Epifauna - animals that live on hard bottom
Filter feeders - obtaining nutrition by straining particles of food from the water column
Infauna – aquatic animals that live in the substrate of a body of water, especially in a soft sea bottom
Invertebrate - animal species that do not develop a vertebral column
Macroalgae - multicellular marine algae
Ocean acidification – the term given to the chemical changes in the ocean as a result of increased carbon dioxide in the atmosphere
pCO_2 – the concentration of carbon dioxide in seawater
Pelagic – living or occurring in the open sea
pH – the scale of acidity and alkalinity
Sessile – attached to the substrate

Chapter 1 - Introduction

The National Marine Sanctuaries Act

The National Marine Sanctuaries Act (NMSA; 16 U.S.C. § 1431 *et seq.*) is the legislative mandate that governs the Office of National Marine Sanctuaries (ONMS) and the National Marine Sanctuary System (NMSS). Under the NMSA, the Secretary of Commerce is authorized to designate and manage areas of the marine environment as national marine sanctuaries. Such designation is based on attributes of special national significance, including conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities. The primary objective of the NMSA is to provide protection for the resources of these special ocean and Great Lakes areas.

NOAA Office of National Marine Sanctuaries

Day-to-day management of national marine sanctuaries has been delegated by the Secretary of Commerce to ONMS. ONMS serves as the trustee for 14 marine protected areas encompassing more than 170,000 square miles of ocean and Great Lakes waters. The 13 national marine sanctuaries and one marine national monument represent areas of America's ocean and Great Lakes environment that are of special national significance. Within their waters, giant Humpback Whales breed and calve their young, coral colonies flourish, and shipwrecks tell stories of our maritime history. Habitats include beautiful coral reefs, lush kelp forests, whale migration corridors, spectacular deep-sea canyons, and underwater archaeological sites. These special places also provide homes to thousands of unique or endangered species and are important to America's cultural heritage.

Figure 1: The National Marine Sanctuaries and Marine National Monument

Because of considerable differences in settings, resources, and threats, each marine sanctuary has a tailored management plan. Conservation, education, research, monitoring and enforcement programs vary accordingly. The integration of these programs is fundamental to national marine sanctuary management.

Gray's Reef National Marine Sanctuary

Gray's Reef National Marine Sanctuary (GRNMS or sanctuary) off the coast of Georgia contains one of the largest nearshore, live-bottom reefs of the southeastern United States. Located 16 miles offshore from Sapelo Island, GRNMS is currently the only protected natural reef on the continental shelf off the Georgia coast and one of only a few marine protected areas in the ocean between Cape Hatteras, North Carolina and Cape Canaveral, Florida. NOAA designated the sanctuary in 1981 to protect the quality of this unique and fragile ecological community. The approximately 22-square-mile sanctuary (about 14,000 acres) is just a small part of U.S. territorial waters, yet its value as a natural marine habitat is recognized nationally and internationally.

Within the sanctuary there are rocky ledges with sponge and coral live-bottom communities, as well as sandy-bottom areas teeming with smaller invertebrates. "Live bottom" is a term referring to hard or rocky seafloor that typically supports high numbers of invertebrates (animals without backbones) such as sponges, corals and sea squirts. They form a dense carpet of living creatures that in places completely hides the rock. The rocky ledges on GRNMS can be as tall as six feet but lay in 60 to 70 feet of ocean water. The ledges are complex - they have nooks and crannies, and caves and bumps that provide plenty of places for invertebrates to latch on to or hide in. Those invertebrates provide food for many fishes that also shelter in the cracks and crevices or hover above the reef.

Gray's Reef is not considered a coral reef such as those found in the tropics, as its foundation was not built by living hard corals. Instead, it was formed by the cementing and consolidation of marine and terrestrial sediments (shell fragments, sand and mud) that were originally deposited as a blanket of loose grains between six and two million years ago.

The reef attracts over 200 species of fish that live on or near the substrate (benthic) or that swim in the water above (pelagic). Since the sanctuary lies in a transition zone between temperate and tropical waters, fish population composition changes seasonally. Loggerhead sea turtles, a threatened species, use GRNMS year-round for foraging and resting and the reef is in the only known winter calving ground for the highly endangered North Atlantic right whale.

GRNMS was also designated to promote scientific understanding of this unique ecosystem. As a discrete, managed location in the southeast Atlantic marine environment, GRNMS affords the opportunity to serve as a "sentinel site,"[1] where sustained observations help us understand and detect change in the ecosystems it represents, as well as provide early warning of impending problems.

[1] Areas with sustained observations to detect and understand ecosystem change

The Research Area

In December 2011, NOAA GRNMS designated the southern third of the sanctuary as a dedicated research area. The purpose of the research area is to provide a place where scientists are able to study naturally-occurring live-bottom ecosystems to better understand the impact of human activities on the sanctuary's marine resources (ONMS 2011). The research area allows scientists to design and implement studies where critical variables can be controlled over long periods of time. In order to provide an area devoid of some direct human impacts, fishing, diving and stopping a vessel in transit are prohibited. The research area is used to study potential impacts from various human activities and impacts of climate change and natural events like hurricanes and droughts.

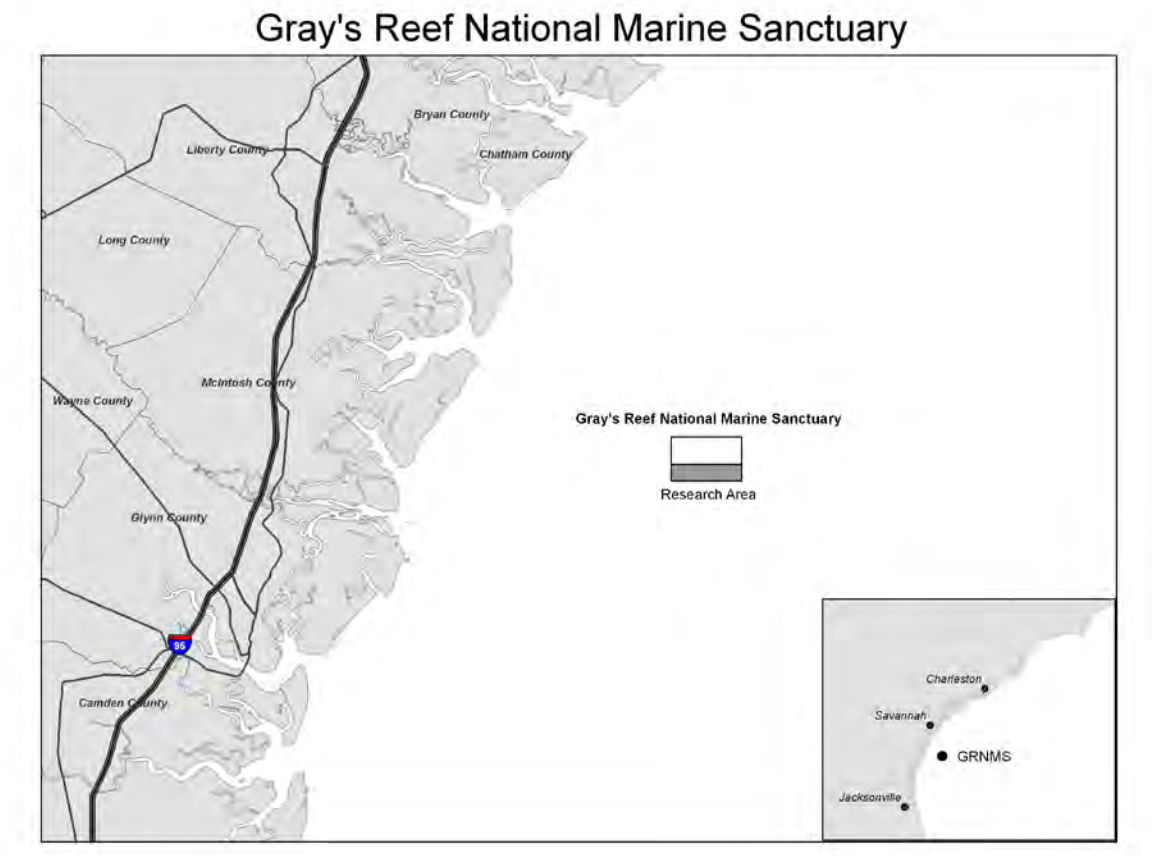

Figure 2: Location of Gray's Reef National Marine Sanctuary, and the research area within the sanctuary.

Management Plan Review

Each national marine sanctuary is required to periodically review the ways it protects and conserves natural and cultural resources. But this document is more than just a legal requirement – it's a vital tool for involving researchers, administrators, stakeholders, and members of the general public in the process of protecting sanctuary resources.

The draft management plan was developed by ONMS and members of the sanctuary staff with input from a variety of stakeholders and subject matter experts. The process was initiated in 2010 with review of the 2006 GRNMS management plan and has always involved public input.

All programs, accomplishments and lessons learned were discussed with the sanctuary advisory council in public meetings and internally with GRNMS and ONMS staff. In addition, NOAA sought comments from the public during an open scoping period from July 1 through August 31, 2012.

Sanctuary vision, mission and goals

As part of the planning process for this draft management plan, the GRNMS staff and advisory council revised existing sanctuary goals and objectives and developed new vision and mission statements to better articulate the desired future for the sanctuary.

A VISION for Gray's Reef National Marine Sanctuary:

Gray's Reef National Marine Sanctuary will continue to be an area teeming with a diversity and abundance of marine life supported by healthy habitats in clean ocean waters. The public will be aware of, care about, and want to protect their sanctuary for current and future generations to use in diverse ways that are compatible with resource protection.

The MISSION of Gray's Reef National Marine Sanctuary:

The mission of Gray's Reef National Marine Sanctuary is to identify, protect, conserve, and enhance the natural and cultural resources, values, and qualities of the sanctuary for current and future generations.

The Gray's Reef National Marine Sanctuary Advisory Council is a community-based advisory panel consisting of representatives from various user groups, government agencies and the public at large. The role of an advisory council is to provide advice to the sanctuary superintendent on the operation of a national marine sanctuary.

GOAL 1 Protect, maintain, restore, and enhance the natural habitats, populations, and ecological processes in the sanctuary.

GOAL 2 Coordinate with federal, state, and local governments, international organizations, and other public and private interests to develop and implement plans to protect the marine environment and the sanctuary, and encourage the conservation of these resources.

GOAL 3 Support, promote, and coordinate scientific research, characterization, and long-term monitoring to enhance the understanding of the sanctuary environment and processes and improve management decision-making for optimal sanctuary resource protection.

GOAL 4 Enhance public awareness, understanding, sustainable use, and appreciation of the sanctuary, while connecting people to the unique resources of Gray's Reef National Marine Sanctuary.

GOAL 5 Allow uses of the sanctuary not prohibited pursuant to other authorities, and consistent with resource protection.

GOAL 6 Dedicate appropriate infrastructure and resources to support all programs, including the creation of models and incentives for conservation of sanctuary resources, and the development of innovative management techniques.

Sanctuary resource conditions

Concurrently with the management plan review, ONMS also assessed sanctuary resources and updated the 2008 GRNMS Condition Report with a 2012 Addendum. Condition reports provide a summary of resources in each sanctuary, pressures on those resources, the current condition and trend of sanctuary resources, and management responses to the pressures that have the potential to threaten the integrity of the marine environment. The 2012 Condition Report Addendum provides a summary of the condition and trends of living marine resources, habitat and water quality in the sanctuary (see Appendix C for the summary table). While showing improvement in some resource conditions, particularly in areas that have been directly impacted by specific management actions, the report also highlighted areas where further emphasis is needed.

The sanctuary made management and regulatory changes with implementation of the 2006 management plan, establishing a no-anchoring rule and restricting fishing to rod and reel and handline fishing gear. Spearfishing was prohibited in 2010 and the

research area was designated in late 2011. Studies conducted since the 2008 GRNMS Condition Report enabled scientists to better and more confidently assess resource conditions and trends. The 2012 Addendum notes that habitat conditions have improved and water quality appears to be unchanged and still considered good. Actions taken regionally for fishery management along with GRNMS actions, such as the prohibition on spearfishing, led to improvements in the condition of living marine resources. Sustainable fishing and effects from fishing on habitat and key species continue to be issues that should be tracked by GRNMS. It is expected that the research area will continue to allow the sanctuary to track changes in sanctuary resource conditions.

Public scoping

From July 1 through August 31, 2012, NOAA sought comments from the public during an open scoping period, which included three public meetings as well as discussions with the sanctuary advisory council.

Very few comments were received during public scoping for the management plan. The topics of concern brought up by the public are all important to GRNMS management – invasive lionfish, the need for increased public awareness of GRNMS, and use of weighted marker buoys during diving and fishing.

Invasive lionfish Two species of Indo-Pacific lionfish (*Pterois volitans and P. miles*) have become well established in the western Atlantic along the eastern coast of the U.S. Their range and abundance is considered to be rapidly increasing in the region (Ruiz-Carus et al. 2006, Morris and Whitfield 2009). The first sighting of lionfish in GRNMS was documented in 2007 and no lionfish were observed again until 2012 when lionfish of varying sizes were more commonly found in the sanctuary and were observed associated with densely-colonized live-bottom habitat.

Public awareness While awareness of GRNMS has grown in the past decade, there is still a concern that the sanctuary is not well known particularly among the communities of non-users. Along with awareness of the sanctuary, there is the challenge to gain more appreciation for the site's unique marine resources and the mandate to manage them sustainably for future generations.

Weighted marker buoys Public comment and sanctuary advisory council discussion during scoping for the management plan review revealed strong support for resolution to the issue of weighted marker buoy use in GRNMS. Currently, regulations prohibit the "placement" of any material on the bottom including weighted marker buoys, which can impede safe recreational diving in GRNMS.

Scoping comments also included a recommendation to consider extending the boundaries of GRNMS to include the North Atlantic right whale's Southeastern U.S. critical habitat. The critical habitat extends from approximately the mouth of the Altamaha River in Georgia to Sebastian Inlet in Florida, and offshore to a distance between 5 and 15 nautical miles. The request was made to also capture significant northeast Florida near-shore marine resources, in addition to protecting the highly endangered right whale's calving area. Northeast Florida resources include endangered and threatened sea turtles and shorebirds, important estuarine and geological resources,

numerous submerged historic shipwrecks, the Crescent Beach submarine spring, and the Matanzas Inlet, which is the last undredged, unjettied inlet on Florida's Atlantic coast. The comment noted that a "…National Marine Sanctuary along the northeast coast of Florida would provide a unified management structure for marine resources and would complement existing management efforts." It was also noted that National Marine Sanctuary processes "…would afford the public an open process to discuss the area's ocean resources and to form a consensus on how to manage them, both for their protection, and for the enjoyment of residents and visitors alike."

An additional comment that requested designation of a national marine sanctuary in northeast Florida also strongly encouraged the activation of a process to nominate and evaluate new sanctuary sites.

As a result of these comments NOAA proposes consideration of whether areas outside GRNMS may have important ecological connectivity with the sanctuary and merit further protection. These considerations would include sites of public concern in northeast Florida but also hard-bottom reefs in the region that are connected to GRNMS through oceanographic circulation or migratory patterns of species that use GRNMS for part of their life history.

Table 1: Issues identified and where addressed in management plan.

Issues suggested by the public are incorporated into the action plans as follows:

▪ Invasive lionfish	Action Plan I	Objective SR4, Activity 4B, page 20
▪ Public awareness	Action Plan II	Page 23
▪ Weighted marker buoys	Action Plan I	Objective SR5, Activity 5A, page 21
▪ Areas of ecological connectivity	Action Plan I	Objective SR6, page 22

Chapter 2 - Draft Management Plan

Overview

This section outlines the specific work Gray's Reef National Marine Sanctuary (GRNMS) management proposes to undertake over the next five to ten years. GRNMS was established to protect and conserve its resources and to allow uses that are compatible with resource protection. The draft management plan represents the way we put our sanctuary's mission and vision into action. Protecting and conserving these resources requires planning for various programs such as science, education and marine operations. The challenge of facilitating commercial and recreational uses to the extent compatible with the primary objective of resource protection and the potential impacts of climate change also means that sanctuary management must look ahead to future needs and areas outside sanctuary boundaries that may influence sanctuary resources.

The objectives and activities in the following sections are derived from the sanctuary vision, mission and goals, evaluation of the 2006 management plan, public scoping, current resource conditions and protection issues, implementation of the research area, new technologies, emerging issues and public awareness needs. Throughout the process considerable discussion with, and recommendations received from, the sanctuary advisory council, including input to the council from its working groups, fine-tuned the plan and helped to set priorities.

Our management plan is divided into three distinct but complementary themes each of which concurrently allows us to achieve our goals, fulfill our vision and meet a variety of objectives:

I: Maintain or Improve the Condition of all Sanctuary Resources

II: Increase the Awareness of, and Support for, GRNMS

III: Advance Collaborative and Coordinated Management

The effectiveness of implementing the management plan depends upon the availability of resources and partnerships. Predicted lean budgets for the next few years also necessitate more focused priorities and the leveraging of resources through a broad range of options including grants and donations where feasible. Strong partnerships between the ONMS and other resource management agencies, the scientific community, stakeholders and the public-at-large are needed to realize the coordination and program integration that the NMSA calls for in order to comprehensively manage national marine sanctuaries, individually and as a system.

Evaluation of the sanctuary's performance is an integral component of the successful management of GRNMS as a public trust resource and a means to work more effectively

toward the GRNMS vision. On an annual basis, specific activities would be integrated into fiscal-year operating plans as resources and priorities dictate. Prior to developing each successive year's operating plans, the activities will be evaluated to see how well they are working.

Each activity in this draft plan is assigned a rating for priority, cost and effort (Table 2). In addition to priority rating, evaluating all activities for the expected costs and staffing needs helps GRNMS management to develop each year's operating plans.

Objectives and activities related to historical/cultural resources were not developed for this management plan, in part due to budgetary constraints. GRNMS does not have any evidence of maritime archaeological resources. Limited paleontological resources were identified and described in the 2006 Management Plan (NMSP 2006).

Table 2: Key to priority, cost and effort

Priority	Cost	Effort
H – high priority	**$$$** - high cost (≥ $24K)	▲ – high effort (≥ 50 person-days*)
M – medium priority	**$$** - moderate cost ($11K - $24K)	▬ - moderate effort (26-50 person-days*)
L – low priority	**$** - low cost ($0 - $10K)	▼ – low effort (≤ 25 person-days*)

*A person-day = 8 hour work day

I: Maintain or Improve the Condition of all Sanctuary Resources (SR)

The purpose of the activities in this section is to strengthen resource protection of all sanctuary resources – habitat, water and living marine resources. Tied to this purpose is allowing activities that are compatible with resource protection and reviewing those activities (i.e., fishing, diving, research and education) periodically. The objectives would be accomplished through better understanding of sanctuary resources, as well as the human and natural impacts on those resources. This is accomplished through research and monitoring along with communicating the information to users and non-users of GRNMS. Most sanctuary goals are addressed through these objectives and activities.

GRNMS Goals Addressed in Section I:

Goal 1: Protect, maintain, restore, and enhance the natural habitats, populations, and ecological processes in the sanctuary.

Goal 2: Coordinate with federal, state, and local governments, international organizations, and other public and private interests to develop and implement plans to protect the marine environment and the sanctuary, and encourage the conservation of these resources.

Goal 3: Support, promote and coordinate scientific research, characterization, and long-term monitoring to enhance the understanding of the sanctuary environment and processes and improve management decision-making for optimal sanctuary resource protection.

Goal 4: Enhance public awareness, understanding, sustainable use, and appreciation of the sanctuary, while connecting people to the unique resources of Gray's Reef National Marine Sanctuary.

Goal 5: Allow uses of the sanctuary not prohibited pursuant to other authorities, and consistent with resource protection.

Objective SR-1: Maintain good [2] water quality in GRNMS over the next five years.

Water quality in GRNMS is considered to be good and unchanging (ONMS 2012). Ongoing coastal and inland development, with associated population increases dictate that monitoring is important for early detection of potential water quality problems. The following activities are designed to continually monitor the status and trends of sanctuary water quality and to inspire behavioral changes in coastal and inland populations. Partners considered to accomplish this objective include the Skidaway Institute of Oceanography (SkIO) and Sea Grant.

Activity SR-1A – Water quality monitoring and data analysis

M $$ ▼

[2] "Good" water quality is defined in the GRNMS Condition Report Addendum as: conditions do not appear to have the potential to negatively affect living resources, habitat quality or human health. Few or no activities occur that are likely to negatively affect water quality.

Implement and maintain a water quality program, monitoring for nutrients, contaminants and seasonal or periodic changes that may result in degradation of water quality.

Activity SR-1B - Education and outreach
M $$ ▲
Translate water quality goals and GRNMS monitoring results into education and outreach materials and programs, such as website updates to influence behavior changes that protect water quality.

Activity SR-1C – Water quality program evaluation
M $ ▼
Evaluate effectiveness of the water quality program and adapt as indicated by evaluation results. In the case of water quality declines below the threshold of "good" request the assistance of the GRNMS Sanctuary Advisory Council, including its Science Advisory Group, to develop a plan of action.

Objective SR-2: Continually monitor and annually assess climate and oceanographic conditions in GRNMS in order to inform other GRNMS projects and assess potential impacts of climate change.
GRNMS collects information on current, salinity, water temperature, wind speed and direction, wave height, dominant wave period, average wave period, air temperature, atmospheric pressure, pH, pCO_2, dissolved oxygen and turbidity using a National Data Buoy Center (NDBC) buoy and seafloor instruments. Ongoing observations collected in GRNMS provide context for various monitoring projects and a baseline for the effects of climate change. Partners considered to accomplish this objective include the University of Georgia, National Data Buoy Center, Pacific Marine Environmental Laboratory, Southeast Coastal Ocean Observing Regional Association.

Gray's Reef - a Sentinel Site

Gray's Reef is well poised to serve as a sentinel site (areas with sustained observations to detect and understand ecosystem change) for regional climate change. We currently conduct near-real-time monitoring of water temperature, pCO_2 and pH which will provide early warning measures of ocean warming and acidification.

In addition, the sanctuary will be able to determine the potential northern migration of more sub-tropical species which could provide indications of ocean warming.

Activity SR-2A - Ocean observations and data analysis
H $$$ -
Work with regional and national partners to collect oceanographic and climate data, and produce annual reports.

Activity SR-2B – Climate Change Site Scenario
L $ ▲
Develop a site scenario to assess potential impacts of climate change on resources of GRNMS.

Activity SR-2C - Education and outreach

H $ ▼

Translate climate information and oceanographic monitoring results into education and outreach materials and programs such as news stories on ocean acidification.

Activity SR-2D – Climate and oceanographic studies program evaluation

H $ ▼

Ocean observations analyses would be reviewed and evaluated annually by the GRNMS Sanctuary Advisory Council and its Science Advisory Group to ensure that these programs are producing results needed for management of sanctuary resources.

Objective SR-3: Maintain GRNMS habitats in good [3] condition over the next five years.

The abundance, distribution and condition of the major habitat types in GRNMS is currently considered good, although human impacts have the potential to negatively alter live-bottom habitats. The trend in these conditions is unknown. Because habitats within GRNMS may be impacted by events such as currents and tides, storms, marine debris, and extractive activities, continued monitoring of habitat status is necessary. The existence of the research area within GRNMS allows for investigations to distinguish between some human-induced (e.g., fishing and diving) and natural influences. The following activities are designed to monitor the condition of GRNMS habitats. Partners considered to accomplish this objective include Georgia Southern University, NOAA Center for Coastal Environmental Health and Biomolecular Research, National Marine Fisheries Service, Coastal Carolina University, Jacksonville University, Team Ocean Volunteer Divers, and the College of Charleston.

Activity SR-3A – Habitat mapping

M $$ ▼

Conduct multi-beam and side scan sonar mapping of the sanctuary and surrounding areas. Assess data for changes in abundance and distribution of the major habitat types as compared to existing maps.

Activity SR-3B – Habitat condition studies

H $$ -

Investigate the condition of habitats inside and outside the research area.

Activity SR-3C – Contaminants monitoring

L $$ ▼

Periodically sample organisms and sediments for contaminants.

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[3] Habitats in "good" condition are defined in the GRNMS Condition Report Addendum as: habitats are in pristine or near-pristine condition and are unlikely to preclude full community development. Contaminants do not appear to have the potential to negatively affect living resources or water quality. Few or no activities occur that are likely to negatively affect habitat quality.

Activity SR-3D – Marine debris monitoring and assessment

L $ ▼

Conduct marine debris assessments at established monitoring sites in the sanctuary.

Activity SR-3E – Education and outreach

M $ ▼

Translate habitat monitoring results into education and outreach materials and programs, such as public awareness products on the effects of marine debris.

Activity SR-3F – Habitat program evaluation

M $ ▼

Monitoring and research outcomes would be evaluated annually by the GRNMS Sanctuary Advisory Council and its Science Advisory Group to ensure that programs are producing results needed for management of sanctuary habitat.

Sanctuary Condition Reports

With completion of all 14 sanctuary condition reports (including the GRNMS Condition Report), it has been determined that a number of changes to the structure of the reports are necessary, including modifications to the 17 questions addressed by each sanctuary, and an expansion to the Pressure-State-Response framework to consider both "drivers" of the pressures found at each sanctuary and the ecosystem and societal benefits derived from resource integrity. These changes are already underway and will be implemented when the next round of reports begins, including addressing the modified questions.

Objective SR-4: Improve the overall status of living resources to good [4] and maintain it at that level over the next five years.

The status of biodiversity in GRNMS is considered to be good (ONMS 2012), however the other measures of living resource conditions range from "undetermined"[5] to "fair"[6] to "good/fair[7]. The status of economically-valuable fish found in GRNMS has been improved by South Atlantic Fishery Management Council (SAFMC) actions (e.g., restrictions on harvest of Black Sea Bass and Red Snapper). More data,

[4] To achieve an overall "good" rating for living resources, the following definitions must be met per the GRNMS Condition Report Addendum: biodiversity appears to reflect pristine or near-pristine conditions and promotes ecosystem integrity. Extraction does not appear to affect ecosystem integrity. Non-indigenous species are not suspected or do not appear to affect ecosystem integrity. Key and keystone species appear to reflect pristine or near-pristine conditions and may promote ecosystem integrity. The condition of key resources appears to reflect pristine or near-pristine conditions. Few or no activities occur that are likely to negatively affect living resource quality.

[5] Resource status and trend are undetermined per the GRNMS Condition Report Addendum.

[6] Per the GRNMS Condition Report Addendum, extraction may inhibit full community development and function, and may cause measureable but not severe degradation of ecosystem integrity. Selected activities have resulted in measureable living resource impacts, but evidence suggests effects are localized, not widespread.

[7] Non-indigenous species exist, precluding full community development and function, but are unlikely to cause substantial or persistent degradation of ecosystem integrity. Selected key or keystone species are at reduced levels, perhaps precluding full community development and function, but substantial or persistent declines are not expected.

however, is needed to assess the condition of other species of fish and related ecosystem impacts. Likewise, more data is needed to understand the impacts of localized heavy fishing. The following activities are designed to fill these gaps and raise the status of GRNMS' living resources. Partners considered to accomplish this objective include Georgia Southern University, NOAA Center for Coastal Monitoring and Assessment, NOAA Office of Protected Resources, Georgia Department of Natural Resources, University of Connecticut, Team Ocean Volunteer Divers, NOAA Sustainable Fisheries Division, NOAA Fisheries Ecosystem Branch, South Carolina Marine Resources Research Institute, South Atlantic Fishery Management Council, and NOAA Southeast Fisheries Science Center.

Activity SR-4A – Fish and invertebrate monitoring and research

H $$$ ▲

Conduct research on the invertebrates and fishes of GRNMS to better understand natural variability and determine human impacts on community development and structure.

Activity SR-4B – Invasive species

M $ -

Monitor the presence/absence of invasive species in GRNMS and conduct removals as appropriate. The species that have been found in GRNMS to date are green mussels, titan acorn barnacles, orange cup coral (all on artificial substrate); and lionfish.

Activity SR-4C – Endangered and threatened marine resources

L $ ▼

Participate in recovery efforts for the endangered North Atlantic right whale, threatened loggerhead sea turtle, Atlantic Sturgeon and any additional listed species found in GRNMS. Log sightings and report to appropriate agencies.

Activity SR-4D – Education and outreach

M $ ▼

Translate living resource monitoring results into education and outreach materials and programs, such as alerts and website information on protected species.

Activity SR-4E – Living resource program evaluation

M $ ▼

Monitoring and research would be evaluated annually by the GRNMS Sanctuary Advisory Council and its Science Advisory Group to ensure that programs are producing results needed for management of living resources to maintain or improve their status.

Objective SR-5: Facilitate compatible sanctuary uses over the next five years ensuring that the resources are being maintained at a level of good [8].

Recreational fishing is the primary direct human use in the sanctuary, followed by research and recreational diving. Regulatory compliance is considered satisfactory, but overseeing a remote sanctuary is challenging. The regulatory changes suggested in Activity SR-5A would enhance safety for recreational divers and provide a convenience for the fishing public that use marker buoys for drift fishing. The regulatory changes are analyzed in Chapter 3. Partners considered to accomplish this objective include Georgia Department of Natural Resources, NOAA Office of Law Enforcement, NOAA General Counsel Enforcement Section, U.S. Coast Guard, and Coastal Conservation Association of Georgia.

Activity SR-5A – Regulatory changes

H $ ▼

Clarify the anchoring prohibition by adding "…or attempting to anchor" to the existing regulation. Revise regulations to allow use of weighted marker buoys during diving and fishing in GRNMS, while continuing to protect sanctuary resources.

Activity SR-5B – Sanctuary use data

M $$ ▼

Collect and assess data on sanctuary users and uses.

Activity SR-5C – Permitting

H $ ▼

Continue and enhance the sanctuary's permitting program.

Activity SR-5D – Voluntary Compliance

H $ ▼

Conduct community outreach and education programs, such as distribution of brochures at fishing tournaments, to foster understanding of sanctuary resources and regulations and inspire voluntary compliance with those regulations.

Activity SR-5E – Law enforcement

H $$$ ▼

Support and enhance enforcement of regulations in the sanctuary with partners NOAA Office of Law Enforcement (OLE), Georgia Department of Natural Resources (GADNR) Law Enforcement (LE), NOAA Office of General Counsel Enforcement Section (GCES) and the U.S. Coast Guard.

[8] Ibid., pages 16, 18 and 19.

Activity SR-5F – Sanctuary use programs evaluation

H $ ▼

Synthesize and review results from user data, law enforcement and compliance, permitting, and regulatory changes for potential future management applications. Adapt programming as needed to protect sanctuary resources.

Objective SR-6 – Evaluate potential areas outside GRNMS that may have connectivity with GRNMS and may benefit from increased protection.

To ensure adequate protection of sanctuary resources, management must often examine activities and resources beyond the boundaries of a national marine sanctuary. Facilitating commercial and recreational uses to the extent compatible with the primary objective of resource protection and the potential impacts of climate change with management measures also means that NOAA GRNMS must explore the connectivity with areas, marine resources and human uses within a larger ecosystem for effects that may influence sanctuary resources. Partners considered to accomplish this objective include a broad array of federal, state and local resource management agencies, private organizations, and individuals representing GRNMS constituents.

Activity SR-6A – Connected areas working group

M $ -

Work with the Sanctuary Advisory Council to engage a diversity of stakeholders and agencies, with appropriate expertise, to identify and report on areas within the Carolinian Ecoregion that have ecological connectivity with GRNMS and that may benefit from increased protection.

II: Increase the Awareness of, and Support for, GRNMS (AS)

While awareness of GRNMS has grown in the past decade, there is still a concern that the sanctuary is not well known particularly among the communities of non-users. Along with awareness of the sanctuary, there is the challenge to gain more appreciation for the site's unique marine resources and the mandate to manage them sustainably for future generations. In addition, potential budget restructuring at the national level may diminish some education funding, requiring GRNMS to reevaluate current K-12 programming. The following activities are designed to address these challenges by focusing on the desired results and analyzing existing outreach and education programming for optimum effectiveness. The purpose is to attain the next level of awareness and support for the sanctuary.

GRNMS Goal Addressed in Section II:

Goal 4: Enhance public awareness, understanding, sustainable use, and appreciation of the sanctuary, while connecting people to the unique resources of Gray's Reef National Marine Sanctuary.

Objective AS-1: Understand where the tools of education and outreach are needed and how programs should be delivered to achieve higher public awareness, understanding, sustainable use, and appreciation of GRNMS during the first year of management plan implementation.

Assessment of accomplishments of the 2006 sanctuary management plan indicates that particular emphasis is still needed in the areas of public awareness and support for the sanctuary. Accomplishing this objective requires targeted and effective education and communications. Partners considered to accomplish this objective include the GRNMS Sanctuary Advisory Council and its recently established Education and Outreach Assessment Working Group. The working group was established specifically to assess education and outreach programming.

Activity AS-1A – Articulate the desired outcomes for achieving understanding, sustainable use, and appreciation of GRNMS using education and outreach programming

H $ -

The GRNMS Sanctuary Advisory Council and its Education and Outreach Assessment Working Group would be tasked with recommending a suite of desired results for GRNMS outreach and education programming.

Activity AS-1B – Assess existing programs

H $ ▲

As directed by the Sanctuary Advisory Council, the Education and Outreach Assessment Working Group would assess the existing GRNMS education and outreach programs to see if the programs achieve the desired outcomes. Identify gaps in programming.

Activity AS-1C – Adjust existing programs and develop new programs as necessary
H $ -
Restructure existing outreach and education programs and develop new programs to achieve understanding, sustainable use, and appreciation of GRNMS. Outline programming for the remaining life of the management plan.

Objective AS-2: Implement education and outreach programming to achieve the desired outcomes by year 5 of the management plan as defined in Objective 1.
Upon completion of a full assessment of GRNMS education and outreach programming, the action plan and specific education and outreach activities would be detailed. Partners considered to accomplish this objective would likely resemble those involved in Objective AS-1.

Activity AS-2A – Education and outreach programming
H $$$ ▲
Conduct new or ongoing education and outreach programming.

Programs like the popular Rivers to Reefs teacher workshops and Gray's Reef Ocean Film Festival would continue while education and outreach programs are assessed and restructured.

III: Advance Collaborative and Coordinated Management (M)

The purpose of the objectives and activities in this section is to outline the activities that enable all the other objectives and activities in the proposed management plan and to increase efficiencies and the effectiveness of GRNMS management. GRNMS currently occupies an office building on the campus of the Skidaway Institute of Oceanography (SkIO; part of the University of Georgia) on Skidaway Island near Savannah, Georgia. The sanctuary's mission is supported by seven full-time GRNMS staff, a significant portion of a regional full-time staff member, a NOAA Corps officer and a number of part-time interns and volunteers.

GRNMS Goal Addressed in Section III:

Goal 6: Dedicate appropriate infrastructure and resources to support all programs, including the creation of models and incentives for conservation of sanctuary resources, and the development of innovative management techniques.

Objective M-1: In year one of the revised management plan fill vacant positions and restructure staffing assignments to improve operational capabilities, efficiency and effectiveness. GRNMS staffing levels are currently inadequate as the site has been functioning without a full-time research coordinator and without a full-time deputy superintendent. ONMS staffing plans call for full-time research coordinators at all sanctuary sites and deputy superintendents at most sites. The scope of duties for the remainder of the staff, such as education and outreach, may also adjust in the analysis that takes place.

Activity M-1A – Staff vacancies
H $$$ ▼
Hire a research coordinator.

Activity M-1B – Staff structure analysis
H $ ▼
Analyze current structure of GRNMS staff and adjustments for more efficient and effective operations.

Activity M-1C – Staff restructuring
M $ ▲
Restructure staff responsibilities for more efficient and effective operations based on analysis of the current structure.

Objective M-2: Continue to maintain, and acquire as necessary, the infrastructure required to accomplish the mission and goals specified in the GRNMS management plan.
GRNMS staff currently occupies a leased office building on the SkIO campus. Sanctuary vessels, vessel docking, dive locker and other field equipment storage are located nearby and the sanctuary currently operates three vehicles. A facilities master plan was completed in 2010 and an outreach facilities strategy was done in 2011. The 2010 ONMS National Facilities and Exhibits Master Plan suggested improvements to existing facilities, including improved office space, vessel docking, dive locker and field equipment storage, in addition to consideration of a stand-alone visitor center in downtown Savannah. Partners considered to accomplish this objective include the National Marine Sanctuaries Foundation, Visit Savannah, Savannah Area Tourism Leadership Council, Skidaway Institute of Oceanography, and Savannah Maritime Association.

Activity M-2A – Maintain current infrastructure
H $$$ ▲
Maintain current facilities, vessels, vehicles and other equipment.

Activity M-2B – Continue to investigate the implementation of the 2010 plan for facilities and infrastructure, including the concept of a stand-alone visitors center.
L $$ ▼
Long-range planning should include seeking sources of support of a downtown Savannah visitor center. Activities for the next five years would concentrate on maintaining existing facilities and improving their security and efficiency.

Objective M-3: "Green" GRNMS facilities and operations to meet standards of the ONMS Climate Smart initiative by year five.
GRNMS has a commitment to continually improve operational and business practices to reduce the site's environmental impacts (i.e., greening). Staff would seek certification as a Climate Smart[9] national marine sanctuary. Partners considered to accomplish this objective include SkIO and Georgia Southern University Center of Sustainability.

Activity M-3A – Green operations assessment
L $ ▼
Staff would assess existing operational and business practices to meet standards for emissions, transportation, energy efficiency, waste management and supplies, landscaping and water management.

[9] See NOAA's Climate-Smart Sanctuaries: Helping the National Marine Sanctuary System Address Climate Change. ONMS, 2010.

Activity M-3B – Advanced GRNMS greening

L $ ▼

Develop a plan and implement actions for further greening of GRNMS facilities and operations based on the assessment and ONMS standards.

Objective M-4: Annually develop operating plans that articulate how GRNMS resources would be distributed to meet the site's goals and objectives, and conduct ongoing evaluations of the effectiveness of annual operating plans toward meeting management plan objectives.

This objective captures the "big picture" planning and evaluation for GRNMS on an annual basis. The annual operating plans support the objectives of the management plan.

Activity M-4A – Annual operating plan

H $ ▼

Formulate an annual operating plan to meet the objectives of the overall GRNMS management plan and GRNMS annual budget allocation.

Activity M-4B – Operating plan evaluation

H $ ▼

Evaluate annual operating plan effectiveness toward meeting program objectives. Seek appropriate participation of the GRNMS Sanctuary Advisory Council.

Objective M-5: Continue to maintain and further enhance community-based and partner engagement to improve collaborative and coordinated management in order to achieve the sanctuary's vision.

GRNMS would continue to engage partners and community entities (academics, intra-agency and inter-agency affiliates, non-governmental organizations and the public at large) to achieve effective sanctuary management.

Activity M-5A – Sanctuary Advisory Council

H $$$ ▲

Continue to support at least three advisory council meetings each year along with subcommittee and working group meetings, as needed.

Activity M-5B – Other partner coordination and collaboration

H $ ▼

Remain engaged with current partners and seek opportunities to facilitate partnerships with other agencies and organizations, including non-governmental conservation organizations and civic groups.

Activity M-5C – Volunteer program

H $ -

GRNMS staff would continue to engage and train volunteers in programming such as Team Ocean diving and citizen science, and remain active in recruiting volunteers to support existing operations and programs while developing additional opportunities for involvement to achieve the objectives and support the activities outlined in this plan.

Chapter 3 – Draft Environmental Assessment

Purpose and Need

The purpose and need for the action - revising the 2006 Gray's Reef National Marine Sanctuary (GRNMS or sanctuary) management plan and revising the GRNMS regulations - are based on both the statutory requirements of the National Marine Sanctuaries Act of 1972 (NMSA; 16 USC §1431 *et seq*.) and the need to address current management issues and concerns.

Purpose for action

The Office of National Marine Sanctuaries (ONMS) serves as the trustee for a system of 14 marine protected areas, encompassing more than 170,000 square miles of ocean and Great Lakes waters. ONMS manages the national marine sanctuaries under the authority of the NMSA. The NMSA authorizes the Secretary of Commerce to designate discrete areas of the marine environment as national marine sanctuaries based on their special conservation, recreational, ecological, historical, scientific, educational, cultural, archaeological, and aesthetic qualities which give them special national, and in some cases international, significance.

The NMSA states that establishing areas as national marine sanctuaries will "maintain for future generations the habitat and ecological services of the natural assemblage of living resources that inhabit [sanctuaries]" (16 U.S.C. 1431(a)(4)(C)). The NMSA further recognizes that "while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of the marine environment" (16 U.S.C. 1431(a)(3)). Accordingly, the ONMS subscribes to a broad and comprehensive management approach to meet the NMSA's primary mandate of resource protection. This approach differs from that of various other national and local agencies and laws directed at managing single or limited numbers of species, habitats, or specific human activities within the marine environment.

ONMS fosters public awareness of sanctuary resources through scientific research, monitoring, exploration, education, and outreach. The program works closely with its many partners and the public to protect and manage the biologically and culturally diverse environments of the National Marine Sanctuary System. Sanctuaries also allow recreational and commercial activities that are compatible with the protection of sanctuary resources.

NMSA section 304(e) requires that each of the national marine sanctuaries periodically engage in management plan review to reevaluate site-specific goals and objectives and, as necessary, revise the management plan and activities regulations to ensure the sanctuary fulfills the purposes and policies of the NMSA (see Appendix B). The purpose

of the proposed, revised management plan (Chapter 2) is to provide an updated integrated program of resource protection, research, education and outreach that meets the mandates of the NMSA and addresses the needs that have emerged since the 2006 management plan was finalized. New vision and mission statements and revised GRNMS goals and objectives provide the framework for developing the proposed management activities, which are consistent with the purposes and policies of the NMSA. The plan outlines comprehensive management objectives that have been developed based upon new knowledge of the site and upon new opportunities.

The proposed, revised management plan (Chapter 2) provides an integrated program of resource protection, research, education and outreach. Modified GRNMS goals and objectives provide the framework for developing management activities, which are consistent with the purposes and policies of the NMSA. The plan outlines comprehensive management objectives that have been developed based upon new knowledge of the site and upon new opportunities.

Need for Action

A revised GRNMS management plan is needed to establish a new framework for sanctuary activities over the next 5-10 years. The proposed, revised management plan is refocused around three themes addressing priorities that have changed since completion of the 2006 GRNMS Management Plan:

- Maintain or Improve the Condition of all Sanctuary Resources
- Increase the Awareness of, and Support for, GRNMS
- Advance Collaborative and Coordinated Management

The revised management plan is also needed to address substantive resource protection issues that have emerged since completion of the 2006 GRNMS Management Plan. Invasive lionfish, for example, are now common in the sanctuary. Lionfish were not documented in GRNMS prior to 2007. Management activities to monitor and remove lionfish are proposed in the revised management plan, along with activities to address the challenges of climate change that were not included in the 2006 GRNMS Management Plan.

The 2006 plan includes several research and monitoring projects that have either been accomplished or are no longer a priority for the sanctuary. A research area was designated in 2011 and is now the primary focus of the GRNMS science program. The research area was not in effect at completion of the 2006 GRNMS Management Plan. Incorporation of the research area into the framework of GRNMS management activities is needed.

In addition, a revised GRNMS management plan is needed to address new administrative, infrastructure and public awareness challenges. Administrative and staffing needs have shifted and infrastructure planning is focused more on community visibility. Education and outreach programs have been implemented successfully, yet

socioeconomic assessment indicates awareness needs in differing audiences not yet reached by those programs. Development of social media (e.g., Facebook) and other communications technology has changed the way target audiences might be reached.

Affected Environment

The affected environment for this action was extensively described in the 2006 GRNMS Final Management Plan/Final Environmental Impact Statement (NMSP 2006) and again in the GRNMS Final Environmental Impact Statement Sanctuary Research Area Designation (ONMS 2011). Those descriptions are incorporated by reference, and are summarized and supplemented below.

Overview

GRNMS is one of the largest nearshore live-bottom reefs in the southeastern United States. The sanctuary is a marine protected area in federal waters (U.S. Exclusive Economic Zone) in the South Atlantic Bight (SAB), an area of continental shelf stretching from Cape Hatteras, North Carolina to Cape Canaveral, Florida (Figure 3). It is the only marine protected area in the region that focuses on protection and conservation of all natural marine resources. Located 17 miles offshore of Sapelo Island, Georgia, the 22-square-mile sanctuary (Figure 4) contains rocky ledges and sandy flats. Unlike reefs built by corals, GRNMS is comprised of scattered sandstone rock outcroppings that rise above the sandy substrate of the nearly flat continental shelf. The reef also supports soft corals, non-reef-building hard corals, attached bivalves and sponges, as well as associated fishes, sea turtles, marine mammals, and pelagic birds.

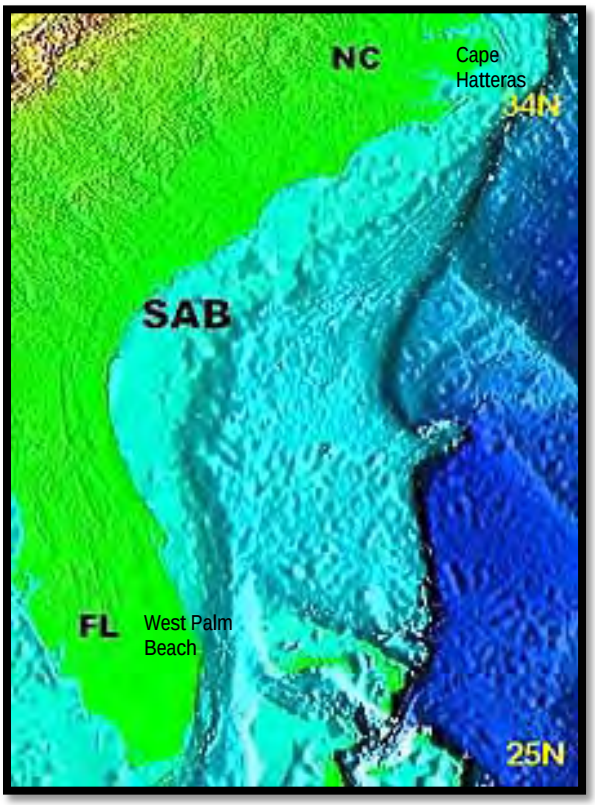

Figure 3: South Atlantic Bight (SAB)

Figure 4: Location of Gray's Reef National Marine Sanctuary

The sanctuary is one of the most popular recreational fishing destinations along the Georgia coast. Fishing for pelagic species, such as King Mackerel, is one of the most prevalent activities, particularly during tournaments. For divers, access to the reef itself requires experience in open-ocean diving; currents can be strong and visibility varies greatly. For those who do not scuba dive or fish, the staff at GRNMS engages the public through extensive land-based education and outreach programs. For scientists, the sanctuary is a living laboratory for a variety of marine research and monitoring projects.

Biological and Physical Resources

Water and Climate

The outer reaches of the SAB are dominated by the Gulf Stream flowing northeastward. The inner area is defined by the curves of the coastline between Cape Canaveral and Cape Hatteras and is dominated by tidal currents, river runoff, local winds, winter storms, hurricanes and seasonal atmospheric changes. GRNMS lies at the break between the inner- and mid-shelf zone of the SAB and is subject to seasonal variations in temperature, salinity and water clarity. It is also influenced by the Gulf Stream, which transports and supports many of the tropical fish species and other animals found seasonally in the sanctuary, and which creates numerous eddies containing upwelled nutrient-rich water at their cores. Ocean currents and eddies also transport fish and invertebrate eggs and larvae from other areas, linking this special place to reefs north and south (NMSP 2006; Hare and Walsh 2007).

Contaminants found in GRNMS may be deposited from the atmosphere, transported from land across the inner shelf to the sanctuary, or carried in by Gulf Stream eddies. Studies suggest that the trapping efficiency of the extensive salt marsh systems on the coast and sediments in the nearshore areas decreases concentrations of contaminants moving offshore and affecting the sanctuary (ONMS 2012).

Habitat

GRNMS is not considered a coral reef such as those found in the tropics, as its foundation was not built by living hard corals. Instead, it was formed by the cementing and consolidation of marine and terrestrial sediments (shell fragments, sand and mud) which were originally deposited as a blanket of loose grains between six and two million years ago. Some of these sediments were brought to the coast by rivers and others were probably transported to the region by ocean currents. The "cement" that glued the grains together more than two million years ago was briny calcium-carbonate seawater. The resulting rock that is the foundation of GRNMS is carbonate-cemented sandstone.

The rocky features of the sanctuary vary from flat, semi-smooth surfaces to exposed vertical scarps and ledges with numerous overhangs, crevices and slopes (Riggs et al. 1996). The irregularities of the bathymetry can be attributed to the easily erodible sandstone that has dissolved and pitted, creating the appearance of isolated ledges and patches of hard bottom. Exposed surfaces are colonized to varying extents by algae and sessile and burrowing invertebrates, which in turn provide shelter, food and nursery areas for a large diversity of fish. This structurally-complex assemblage is known as live-bottom habitat.

Live-bottom habitats typically support high numbers of large invertebrates such as sponges, corals and sea squirts. These creatures thrive in rocky areas, where they are better able to attach themselves to the hard substrate as compared to sandy or muddy "soft" bottom habitats. The percent cover of attached benthic species is significantly greater on higher ledges in comparison to the low-relief ledges. In addition, total percent cover - and cover of macroalgae, sponges and other organisms - is significantly lower on low ledges in comparison to medium and tall ledges (NMSP 2006; Kendall et al. 2007; ONMS 2011).

Although GRNMS is the most intensely surveyed live-bottom feature in the region, diver-focused survey methods provided only basic information on the extent and distribution of the live-bottom areas within the sanctuary. Video transects, coupled with side-scan and multi-beam sonar mapping suggest, however, that sand habitats (rippled sand and flat sand) dominate, accounting for 75 percent of the sanctuary area. Approximately 24 percent of the sanctuary is sparsely- or moderately-colonized live bottom, and less than one percent of the sanctuary is considered densely-colonized live bottom (Kendall et al. 2005).

Sediments within the vast areas of sand in the sanctuary are probably re-suspended and redistributed during times of high wave action that accompany winter and tropical storms. These shifting sands can uncover barely buried sandstone rock areas or,

conversely, cover areas that were previously exposed. The effect of storm-suspended sediments has even been observed to scour entire low-relief ledges, removing all but the hardiest of attached marine organisms (McFall pers. comm.).

Living Resources

Invertebrates

Invertebrates are an important form of living marine resources and a vital component of live-bottom habitat. GRNMS supports a high diversity of invertebrates. The hard bottom provides a firm base for a variety of sessile invertebrates including bryozoans (moss fauna), ascidians or tunicates (sea squirts), sponges, barnacles, and hard-tubed worms that form dense encrustations. Larger sessile invertebrates, such as sea whips and fans (gorgonians), hard corals and large sponges, provide refuges for many smaller, more cryptic invertebrates. Other dominant invertebrates include sea stars, brittlestars, crabs, lobsters, shrimps, bivalves, and snails. The scientific term for the animals living on these hard substrates is "epifauna." The attached (sessile) epifauna are primarily filter feeders (obtaining nutrition by straining particles of food from the water column), while the more motile (having the power to move) epifauna consist mostly of active predators and surface browsers.

The rather featureless sandy bottom overlying the rock substrate within GRNMS and adjacent shelf waters may at first glance appear to be a biological void, especially in comparison to the more visually impressive live-bottom assemblages associated with rocky outcrops. However, these soft-bottom substrates can be teeming with a highly diverse and abundant community that comprises mostly annelids (worms), mollusks (clams and snails) and arthropods (mostly crustaceans like small shrimp). Living buried within these sediments are assemblages of relatively sedentary worms, crustaceans, mollusks, echinoderms (sea stars, sand dollars and sea cucumbers), and other invertebrate species commonly referred to as "infauna." Researchers have estimated that the number of species found in the sandy bottom areas of GRNMS may be as high as 600 species (Hyland pers. comm.). Benthic infauna are predominantly deposit feeders, obtaining nutrition by ingesting organically-enriched sediment particles and associated detrital material that settles onto the seafloor. However, the infauna may consist of filter feeders and active predators as well. Motile epifaunal species such as sea stars and crabs, and more sessile forms attached to small pieces of rock or shell (e.g., barnacles, corals, anemones, sea fans, sea pansies) also can be found living at the surface of these soft bottom substrates. These fauna are a valuable component of the sanctuary ecosystem, playing vital roles in detrital decomposition, nutrient cycling, and energy flow to higher trophic levels. They can be especially important as food to species of fish that feed away from live-bottom rocky outcrops interspersed throughout the shelf.

Because the sanctuary lies within a transition zone between temperate and tropical waters, several invertebrate species appear to be surviving at the edge of their geographic range. The size of many sponges suggests that they may be year-round

residents. Evidence on the growth rates of tropical sponges indicates that some of the larger colonies may be 15-20 years old (McFall and LaRoache, 1998). The same situation exists for a number of the hard and soft corals, many of which are surviving year-round and are at the northern limit of their range.

Fishes

The biologically diverse live-bottom habitat of GRNMS attracts reef-associated fishes including bottom-dwelling and midwater fish species such as sea bass, snapper, grouper and mackerel, as well as their prey. Just over 200 species of fish, encompassing a wide variety of sizes, forms and ecological roles, have been recorded at the sanctuary. Some fish species are dependent upon the reef for food and shelter, and rarely venture away from it during their life. Many of these fishes are nocturnal, seeking refuge within the structure of the reef during the day and emerging at night to feed. Some species of reef-dwelling fish disperse to sandy habitats or to other reef areas north and south or offshore for feeding and spawning. Other reef residents, such as Gag and Black Sea Bass, rely on the inshore areas and estuaries in early life stages.

Many species of reef fish are overfished or subject to overfishing. According to the National Marine Fisheries Service (NMFS), overfished stocks in the waters of the Southeastern U.S. Atlantic include Red Grouper, Red Porgy, Red Snapper and Snowy Grouper. Black Sea Bass, Gag, Red Grouper, Red Snapper, Snowy Grouper, Speckled Hind and Warsaw Grouper are undergoing overfishing.[10] Of these species, Red Snapper, Black Sea Bass and Gag are common at GRNMS, and Red Grouper are occasionally seen.

Recent regional data is showing improvement in the status of Black Sea Bass and Red Snapper, which is reflected in GRNMS. Gag and Scamp, however, have decreased in abundance in visual census transects, and length-frequency measurements of Black Sea Bass, Gag and Scamp (from trap and visual census data) indicate that a large portion of the population is removed upon reaching minimum size, either by fishing or by migration out of the sanctuary. The reduced abundance of these selected key species may inhibit full community development and function in GRNMS (ONMS 2012). In addition, research suggests that a very low level of increased fishing pressure on the sanctuary's ledges could reduce local abundance of snapper-grouper complex species within a short amount of time (Kendall 2008).

In addition to reef-associated fishes, GRNMS serves as habitat for a number of other fish species. King Mackerel, Spanish Mackerel, Great Barracuda, and Cobia make up the majority of coastal pelagic species that are targeted for recreational angling. The high abundance of schooling baitfishes, such as Spanish Sardine and Round Scad, likely attract these pelagic predators to sanctuary waters. There is considerable but

[10] http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm

unmeasured fishing effort on King and Spanish Mackerel during tournaments and at other times. Federal management of coastal pelagic species has resulted in sustainable fisheries for King Mackerel and the stock is not currently overfished (SEDAR 16 2008).

Approximately 30 species of fish spawn in the vicinity of GRNMS and only a third of these are reef-associated (Walsh et al. 2006, Sedberry et al. 2006). The large areas of sandy habitat in the sanctuary form another habitat that is not as rich in fish species, and is not targeted by recreational anglers. These sandy areas support a number of species including flounders, tonguefishes, cusk eels, stargazers, and lizardfishes (Gilligan 1989, Walsh et al. 2006).

Sea turtles

Sea turtles known to occur in the South Atlantic Bight include the Kemp's ridley, hawksbill, leatherback, green and loggerhead. Kemp's ridley, hawksbill, leatherback and green sea turtles are federally listed as endangered under the Endangered Species Act (ESA). Loggerhead sea turtles are divided into nine distinct population segments. The Northwest Atlantic Ocean population is the most abundant sea turtle population in the SAB and is listed as threatened under the ESA. GRNMS is an important area for juvenile and adult loggerheads to rest and forage throughout the year, especially during the summer nesting season when females may nest two to four times on area beaches laying approximately 120 eggs per nest.

Marine mammals

Marine mammals on the southeastern United States continental shelf include cetaceans (whales and dolphins), occasional pinnipeds (harbor seals and sea lions) and sirenians (West Indian manatees). Atlantic Spotted Dolphins and Bottlenose Dolphins are the most common marine mammals at GRNMS. The bottlenose dolphin has been designated as depleted under the Marine Mammal Protection Act. There is currently insufficient data on populations of spotted dolphins in the western North Atlantic Ocean to support a designation. There are four species of ESA-listed endangered whales in the region: North Atlantic Right, Humpback, Sperm and Fin. Of these, only the highly endangered North Atlantic right whale – whose only known calving grounds are off coastal Georgia and northern Florida – has been observed in GRNMS, with sightings occurring during the winter.

Pelagic birds

Pelagic birds, many of which are seasonal migratory species, occur on the middle and outer shelf regions of the SAB, particularly along the western edge of the Gulf Stream. More than 30 species of marine birds occur off the southeastern coast of the United States. Seabirds observed in the sanctuary area include gulls, petrels, shearwaters, Northern Gannet, phalaropes, jaegers and terns. To date, species such as the Band-rumped Storm-Petrel and Audubon's Shearwater have not been observed in GRNMS, although records exist for offshore Georgia. No records for the threatened Roseate Tern

are known from offshore Georgia, including GRNMS. NOAA, however, recognizes the waters of GRNMS may be important as a "stop-over" site for various seabird species that move over long distances.

Invasive species

Non-indigenous (invasive) species that have been documented in GRNMS include the green mussel, acorn barnacle, orange cup coral and lionfish. The green mussel, acorn barnacle and orange cup coral have only been found at the surface on artificial substrate (the data buoy located in GRNMS) and not on the hard bottom. Two species of lionfish, however, have become well established in the western Atlantic Ocean and the range and abundance is rapidly increasing in the region (Ruiz-Carus et al. 2006, Morris and Whitfield 2009). The first sighting of lionfish in GRNMS was documented in 2007 and no lionfish were observed again (including during extensive visual surveys in June 2011) until 2012. Beginning in May 2012, lionfish of varying sizes were more commonly found in the sanctuary and were observed associated with densely-colonized live-bottom habitat.

Socioeconomic Resources

Recreational Fishing

GRNMS attracts recreational fishing enthusiasts. Fishing can be conducted in the sanctuary using rod and reel or handline fishing gear. Although there is no primary access point to the sanctuary, a variety of public and private boat launches and marinas extending from Savannah to St. Mary's, Georgia, serve as staging sites for sanctuary users. Surveys indicate the majority of users in GRNMS are recreational fishing with rod and reel fishing gear (Ehler and Leeworthy 2002).

Recreational fishing at GRNMS occurs year-round but at varying levels of intensity. Most recreational fishing activities occur on weekends. The highest levels of use are during annual fishing tournaments for King Mackerel that occur from May through September. Multiple sources, including aerial photography and on-water Georgia DNR patrol boat records from 1999-2007 were used to determine the number and location of boats in GRNMS, and almost 1300 boat locations were identified (Ehler 2010). Approximately 50% of these boat sightings occurred on fishing tournament days. Analysis of the economic impact of a research area in GRNMS estimated that total expenditures of saltwater fishing in Georgia in 2006 were $119 million. Expenditures related to fishing in GRNMS total $1.5 million annually (Ehler 2010).

Because anchoring is prohibited in the sanctuary, recreational fishing is conducted by trolling or drifting for pelagic species or drift fishing for bottom (reef-related) species of fish. Recreational bottom anglers sometimes prefer the use of marker buoys that are

placed on the bottom with a float at the surface to mark and relocate a fishing spot as their boat drifts.

Commercial Fishing

With designation of GRNMS in 1981, commercial fishing gear such as traps and bottom trawls was prohibited to protect the live-bottom habitat. Regulations with the revision of the GRNMS Management Plan in 2006 now limit fishing in the sanctuary to rod and reel and handline gear only. There are no known commercial fishing operations using GRNMS at this time.

Recreational Diving

A small amount of scuba diving by more experienced divers occurs year-round, although most diving activities occur on weekends during warmer months of the year. Analysis derived from surveys of users of GRNMS on their knowledge, attitudes and perceptions (Leeworthy 2013) indicate that approximately 8% of visitors to the sanctuary dive. Diving is sometimes done in conjunction with recreational fishing activities, although spearfishing is prohibited in the sanctuary. Underwater photography and nature observing are also popular activities for scuba divers.

Research and Education

Scientific research and monitoring are increasingly important activities for GRNMS, particularly since the research area was designated in 2011. The sanctuary is relatively shallow and affords the opportunity for scientists to conduct experiments and make observations using scuba in a productive reef habitat that is relatively close to shore. The proximity of the sanctuary to coastal universities and marine research laboratories makes GRNMS a logical natural area that can be used to further understanding and management of these complex ecosystems. Likewise, GRNMS has been increasingly utilized as a living laboratory for education purposes both at the K-12 and the university level.

GRNMS Infrastructure

Facilities

GRNMS currently occupies a 4000 ft^2 one-story office building on the campus of the Skidaway Institute of Oceanography (SkIO; part of the University of Georgia) on Skidaway Island near Savannah, Georgia. Although the building is leased from SkIO, it was built to the sanctuary's specifications and includes offices, a conference room, computer operations and storage. Sanctuary vessel docking, dive locker and other field equipment storage are also located nearby on the SkIO campus. The location links the sanctuary with other academic institutions of the University System of Georgia such as

Georgia Southern University and the Georgia Institute of Technology, which have facilities and programs on the SkIO campus.

The current office facility, however, provides no public visibility, is remote from the main population area in Savannah, and is difficult to find. Long-term facility goals outlined in the 2010 GRNMS Master Plan suggested that improvements to the existing facilities would further support research and monitoring endeavors. The facilities plan stated that in the long-term, a showcase GRNMS facility is needed to attract top researchers, accommodate growth of staff, storage needs and expanding education programs. Such a facility would also directly support the staff to meet the education and outreach needs, as well as maintain the science and research presence in the sanctuary.

Because GRNMS is located offshore, there is limited opportunity for those who are casually interested in the sanctuary to experience its environment. For this reason, public knowledge about GRNMS is very limited, but could be improved by a visitor center in downtown Savannah to support outreach and education. A report entitled "Downtown Savannah Outreach Facility Strategy" completed in 2011 concluded that, with nearly seven million tourists annually and a growing resident population, the demand for more educational "attractions" is warranted and that the community is supportive of GRNMS and would welcome a downtown visitor center. The study suggested that in the short- and mid-term, the sanctuary should continue and expand its outreach and communications partnerships and that in the long term the sanctuary should implement a dedicated physical location for a GRNMS visitor center.

Vessels and vehicles

GRNMS currently operates two vessels for research and education. The sanctuary adapted a new 41-ft. catamaran in 2008 and has a 36-ft. twin-outboard. The vessels serve as the principal research vessels for the sanctuary but also are used extensively for monitoring and education programs. Since implementation of the research area at GRNMS, there has been additional interest in field research that occasionally exceeds the capabilities of our vessels. There is a need for a vessel that can provide multiple-day and overnight work for researchers. The sanctuary also operates three vehicles, including two hybrids for passenger use and a truck for equipment transport.

Staff and volunteers

The sanctuary's mission is supported by eight full-time GRNMS staff, a significant portion of a regional full-time staff member, a NOAA Corps officer and occasional part-time interns. Staffing levels are inadequate, however, as GRNMS has been functioning without a full-time research coordinator and without a full-time deputy superintendent. ONMS staffing plans call for full-time research coordinators at all sanctuary sites and deputy superintendents at most sites. Hiring a research coordinator would allow the superintendent, who also serves as research coordinator, to fulfill the full suite of duties for that position. The scope of duties for the remainder of the staff, such as education

and outreach, may also adjust in the analysis that takes place when the superintendent's position is restored to a full-time function.

The GRNMS Sanctuary Advisory Council comprises 19 members. These non-governmental volunteers and government agency representatives on the council advise the sanctuary on research and monitoring, enforcement, education and outreach, and management. Council members represent the sanctuary and community stakeholders, including research, education, diving, fishing, conservation, management, enforcement and the community at large. Advisory council members serve as liaisons between their constituents and the sanctuary, keeping sanctuary staff informed of issues and concerns and performing outreach to their respective constituents on the sanctuary's behalf. The advisory council played a large role in the development of this draft management plan by making recommendations based on their experiences with their constituents and their evaluation of the existing (2006) management plan.

Utilizing volunteer support for outreach and citizen science programs (e.g., Team Ocean scientific diving, and phytoplankton monitoring) leverages limited sanctuary staffing resources and provides an opportunity for citizens to contribute to and protect something they care about. Gray's Reef Team Ocean divers help with monitoring and research, and many volunteers help with teacher workshops and large outreach events such as the Gray's Reef Ocean Film Festival. Overall, more than 200 volunteers work annually to collect data, give presentations, advise the sanctuary, and provide support for workshops and outreach events.

Other partnerships

Because community engagement is essential to achieving effective sanctuary management, maintaining partnerships with intra-agency and inter-agency affiliates, environmental non-governmental organizations (NGOs) and the public at large is a high priority. The sanctuary also benefits immensely from partnerships within NOAA, private businesses, research, educational and cultural institutions, and community groups. These entities provide expertise, assets and funding to support the mission of the sanctuary. In exchange for field logistics support, university and agency research partners conduct experiments, surveys and monitoring in the sanctuary. This has resulted in over 50 scientific publications since 2000, based on research conducted in the sanctuary at very little cost to ONMS. Maintaining effective relationships with all of these partners is crucial to better management and protection of GRNMS, increasing knowledge of regional activities, and understanding how those activities may affect GRNMS.

Alternatives Considered

There are three alternatives that are considered for this action:

1. Alternative 1: No action - Leave the current (2006) GRNMS management plan in place and do not revise existing regulations to prohibit attempting to anchor and to allow use of weighted marker buoys in the sanctuary for diving and fishing.

With the no-action alternative, GRNMS would continue to operate with the 2006 Final Management Plan as the framework for sanctuary activities. In addition, the clarification for the existing anchoring prohibition (adding "…or attempting to anchor"), or an exemption for the use of weighted marker buoys to enhance diving safety and fishing convenience in the sanctuary would not be proposed.

2. Alternative 2: Adopt and implement the proposed management plan and make only the anchoring clarification to existing GRNMS regulations.

As stated in the Purpose and Need section above, a revised GRNMS management plan is needed to meet significant challenges that have evolved since 2006. Among those issues are climate change and invasive species in the sanctuary, current limited financial and personnel resources, and the need for more community visibility. A new plan is also needed to better incorporate the research area around which most science activities are now focused. The result of a recent survey of user and non-user knowledge, attitudes and perceptions also heightens the need for an assessment of education and outreach programs and the sanctuary's constituent base. In addition, technologies in science and communication have advanced significantly since 2006.

The need for a clarification to the anchoring prohibition also became apparent since the regulations became effective in 2007. That correction – adding "…or attempting to anchor" to the existing regulation would be proposed with Alternative 2. An exemption to current GRNMS regulations to allow the use of weighted marker buoys would *not* be proposed under this alternative.

3. Alternative 3: Adopt and implement the proposed management plan and propose a regulatory clarification to the anchoring prohibition along with an exemption for the use of weighted marker buoys in GRNMS (Preferred Alternative).

This alternative includes all elements of Alternative 2 above in addition to a proposed exemption to existing GRNMS regulations to allow the use of weighted marker buoys for diving safety and fishing convenience. This is NOAA's preferred alternative.

Environmental Consequences

The changes to activities in the proposed draft management plan and proposed rulemaking would not result in any significant impacts. However, activities proposed in the draft plan that are not ripe for decision may require further analysis (e.g., preparation of a supplemental EA or an environmental impact statement) in order to comply with NEPA and the NMSA. Specifically, actions to protect areas outside of GRNMS (i.e., to expand the boundary to include these areas), or to build a visitor center would be considered beyond the scope of this assessment and would require further analysis. The following discussion provides analysis of the effects of the three alternatives on sanctuary resources described in the Affected Environment section (page 32).

Alternative 1 - No-Action

Under the no-action alternative, GRNMS would continue to operate with the 2006 management plan as the framework for sanctuary activities. The goals and objectives of the 2006 management plan would remain in place and unchanged. No changes would be proposed to existing regulations, including a regulatory clarification on the anchoring prohibition or an exemption for the use of weighted marker buoys in the sanctuary.

Biological and Physical Resources

Biological and physical resources of GRNMS are addressed most directly through science and resource protection programming. The 2006 GRNMS management plan describes many research and monitoring projects that have either been accomplished or are no longer a priority for the sanctuary. In addition, GRNMS designated the research area in 2011 that now provides the umbrella for the majority of scientific activities. While proposed research area activities were outlined in the final environmental impact statement for designation of the research area (ONMS 2011), they are absent from the 2006 plan. The 2006 plan also reflects outdated information about the condition of all sanctuary resources. Emerging issues, such as the effects of invasive lionfish or climate change on sanctuary resources, are also not addressed.

Many education and outreach programs outlined in the 2006 management plan have also been implemented. Public comment and a recent socioeconomic survey indicates the need for reevaluation of current programming to achieve increased awareness of, and support for, GRNMS and consequent protection of the biological and physical resources.

While the revision of a management plan does not, in itself, enable or prevent implementation of any particular strategy or activity, without the revision, the potential beneficial effects (e.g., addressing emerging issues like invasive lionfish) from implementation of the revised management plan may not be realized because the overall management model would continue to be outmoded.

Under the no-action alternative (Alternative 1), no regulatory clarification language would be proposed for the existing anchoring prohibition. Enforcement officials have experienced occasions where sanctuary users were "attempting" to anchor in GRNMS despite the prohibition, but because the anchor had not yet been "set", the operator was able to state that they were not technically anchored. With the proposed clarification, enforcement action can be taken when people are observed attempting to anchor even if the anchor has not yet been set in the seabed. The absence of regulatory clarification to the existing prohibition could be expected to have less than significant adverse effects on resources because the prohibition is not made more robust from an enforcement and prosecutorial standpoint, helping to prevent the use of damaging anchors on live-bottom habitat.

Under the no-action alternative (Alternative 1), no exemption for the use of weighted marker buoys would be proposed. Currently, GRNMS regulations prohibit the "placement" of any material on the bottom, which prevents the use of weighted marker buoys that are placed on the bottom for recreational diving safety and recreational fishing convenience. Because under the no-action alternative, no exemption for the use of weighted marker buoys would be proposed, a less than significant beneficial effect on biological and physical resources would be expected since marker buoys would continue to be prohibited, thus weights - attached to a surface marker – would not be placed on bottom habitat in GRNMS.

Socioeconomic Resources

The absence of a clarification to the anchoring regulation could be expected to have less than significant adverse effects on socioeconomic resources since the clarification to make the regulation more robust would not be provided to enhance compliance and enforcement of the anchoring regulation. With the clarification, sanctuary resources would be better protected for the benefit of all sanctuary users including researchers, educators, divers and fishermen.

GRNMS regulations prohibit the "placement" of any material on the bottom, which prevents the use of weighted marker buoys that are placed on the bottom for recreational diving safety and recreational fishing convenience. Public comment and sanctuary advisory council discussion during scoping for the management plan review revealed strong support for an exemption in the current regulations to allow the use of weighted marker buoys. With no regulatory exemption proposed for the use of weighted marker buoys under the no-action alternative, recreational divers would not have the option of using weighted marker buoys to increase human safety. Markers provide a stationary point for divers to more accurately locate a site and for boat operators to find divers on their ascent. Due to the small number of recreational divers in GRNMS, it would result in less than significant adverse socioeconomic effects. Effects on recreational anglers would also be expected to be less than significant adverse because the use of marker buoys is more of a convenience than a necessity for fishing in GRNMS.

GRNMS Infrastructure

As noted above, while the revision of a management plan does not, in itself, enable or prevent implementation of any particular strategy or activity, including those related to staffing (e.g., the need for a research coordinator), without the revision, implementation of the revised management plan may not be realized because the overall management model would continue to be outmoded.

Alternative 2 - Adopt and implement the proposed management plan and propose only the anchoring clarification to existing GRNMS regulations.

Under Alternative 2, NOAA would adopt the new GRNMS vision and mission along with revised goals and objectives. The proposed management plan of activities would also be adopted with this alternative. Only the clarification to the existing anchoring regulation would be proposed. An exemption for the use of weighted marker buoys would not be proposed.

Biological and Physical Resources

As noted above in the no-action alternative (Alternative 1), biological and physical resources are addressed most directly through science and resource protection programming. The proposed management plan for GRNMS contains six objectives that all focus on the program's primary purpose of resource protection as well as the science that supports management decision-making. The objectives roughly match sanctuary resources (water, habitat and living marine resources) as they were assessed in the 2012 Condition Report Addendum (ONMS 2012). In addition, human uses that have the potential to affect GRNMS resources are addressed. These activities outline the needed research and monitoring to assess environmental conditions and increase the understanding of sanctuary resources. The activities are also designed to improve the condition of resources, such as fish in relation to sustainable fishing, that are considered "fair" rather than "good" (ONMS 2012; see Appendix C).

The concept of examining areas outside of GRNMS to enhance resource protection is also addressed. Areas and resources that may have connectivity with the sanctuary would be considered for additional protection. Additional protection could take the form of a sanctuary boundary expansion or working with other agencies to result in increased protection.

The activities proposed in the revised management plan also address potential threats to biological and physical resources through targeted, enhanced outreach on the importance of those resources, and the need to protect them. The audiences for the outreach programs include both users and non-users of the sanctuary. The purposes of programming would be to alter human behavior such that users of the sanctuary protect the resources and comply with regulations, and non-users of the sanctuary would

become more aware and inclined to support GRNMS and protection of sanctuary resources.

NOAA anticipates that the proposed addition of "…or attempting to anchor" to the existing anchoring prohibition would result in less than significant beneficial effects for biological and physical resources because enforcement action can be taken when people are observed attempting to anchor even if the anchor has not yet been set in the seabed. This proposed regulatory action with Alternative 2 is expected to help prevent the use of damaging anchors on live-bottom habitat because a more robust regulation would serve to enhance regulatory compliance and enforcement.

Under Alternative 2, no exemption for the use of weighted marker buoys would be proposed. Similar to Alternative 1, this alternative would be expected to result in less than significant beneficial effect on biological and physical resources because marker buoys would continue to be prohibited, thus weights - attached to a surface marker – would not be placed on live-bottom habitat in GRNMS.

Socioeconomic Resources

Only the clarification for the anchoring regulation would be proposed under Alternative 2, which could be expected to have less than significant beneficial effects on socioeconomic resources since the addition of "…or attempt to anchor" would make the regulation more robust. With the proposed clarification, enforcement action can be taken when people are observed attempting to anchor even if the anchor has not yet been set in the seabed. Sanctuary resources would be better protected for the benefit of all sanctuary users including researchers, educators, divers and fishermen.

Similar to Alternative 1, with no regulatory exemption proposed for the use of weighted marker buoys under Alternative 2, NOAA expects a less than significant adverse socioeconomic effect on recreational divers because the markers provide a stationary point for divers to more accurately locate a site and for boat operators to find divers on their ascent. Recreational anglers would also be less than significantly adversely affected, because use of marker buoys is more of a convenience than a necessity for fishing in GRNMS.

GRNMS Infrastructure

The objectives focused on GRNMS infrastructure, volunteers, annual planning, and community and partnership enhancements are the foundation that makes the other activities possible. In particular, the need to fill the research coordinator's position would be critical with the proposed activities. Vessel operations and other demands on infrastructure, including operations staff, would be expected to increase somewhat. Demand on other existing GRNMS facilities and infrastructure, including staff, is expected to remain approximately the same. The overall effect on GRNMS management capabilities is expected to be negligible.

As noted in the GRNMS Infrastructure section of the Affected Environment, a "dedicated physical location for a GRNMS visitor center" has been suggested. Raising public awareness of GRNMS is difficult because of the sanctuary's remote location offshore and the office's location on Skidaway Island outside of downtown Savannah. The environmental consequences of a new visitor center cannot be determined until action is ripe for decision, and would be analyzed in a separate public process at the appropriate time.

Alternative 3 (Preferred Alternative) - Adopt and implement the proposed management plan in this document; propose a clarification to the anchoring regulation along with an exemption for the use of weighted marker buoys in GRNMS.

Under Alternative 3, the preferred alternative, NOAA would adopt the new GRNMS vision and mission along with revised goals and objectives, and the proposed management plan of activities as in Alternative 2 above. In addition to adding "…or attempting to anchor" to the existing anchoring prohibition language, GRNMS would propose an exemption to existing regulations to allow the use of weighted marker buoys in the sanctuary for diving safety and fishing convenience.

Weighted marker buoys would need to be continuously tended and used during otherwise lawful fishing or diving activities. Weighted marker buoys could not be attached to a vessel and could not be capable of holding a boat at anchor. Weights used with a marker buoy could not have a combined weight of more than ten (10) pounds and could not be attached with line that is greater than one-fourth inch (1/4"). Weighted marker buoy would need to be removed from the sanctuary within twelve (12) hours of deployment. Any weighted marker buoy that is not continuously tended could be removed by authorized personnel without notice.

The only difference between alternatives 2 and 3 is the addition of the proposed weighted marker buoy exemption in Alternative 3. Only the proposed regulatory exemption is analyzed below. Other analysis is provided in Alternative 2 above.

Biological and Physical Resources

The proposed regulatory change to exempt weighted marker buoys is expected to result in less than significant adverse effects on the biological and physical resources of GRNMS. Anchoring in GRNMS is prohibited to protect sensitive bottom habitats, so recreational diving and fishing must be conducted without anchoring ("live-boat" diving, troll or drift fishing). GRNMS regulations also prohibit the "placement" of any material on the bottom, which prevents the use of marker buoys that are placed on the bottom for recreational diving safety and recreational fishing convenience. The proposal to exempt placement on the bottom of weighted marker buoys is primarily for the purpose of enhancing recreational diving and increasing human safety. Markers provide a stationary point for divers to more accurately locate a site and for boat operators to find divers on their ascent. Due to open ocean conditions with strong currents and often limited visibility, GRNMS does not attract many divers. As noted in the Affected

Environment section, surveys indicate that a small percentage of visitors to the sanctuary engage in diving. A sizeable increase in divers in GRNMS if marker buoys are allowed is not anticipated due to the open ocean conditions and additional prohibition on spearfishing in GRNMS (ONMS 2009).

In addition, GRNMS would require that weighted marker buoys be continuously tended and used during otherwise lawful fishing or diving activities. Weighted marker buoys would not be attached to a vessel and would not be capable of holding a boat at anchor. Weights used with a marker buoy would not have a combined weight of more than ten (10) pounds and could not be attached with line that is greater than one-fourth inch (1/4"). Weighted marker buoys would need to be removed from the sanctuary within twelve (12) hours of deployment. Any weighted marker buoy that is not continuously tended could be removed by authorized personnel without notice.

Thus, only minor effects would be expected from the weights - attached to a surface marker – temporarily placed on live-bottom habitat in GRNMS for diving. With proposed regulatory limits, promotion of careful use of weighted marker buoys, and the small number of divers expected in the sanctuary, the potential effects on GRNMS habitat are expected to be less than significantly adverse.

In the past, very few anglers have been observed using weighted markers buoys for fishing in GRNMS. Allowing the use of weighted marker buoys for fishing in GRNMS, however, is expected to result in a slight increase in fishing with weighted marker buoys. As with diving activity, only minor effects would be expected from the weights - attached to a surface marker – temporarily placed on live-bottom habitat in GRNMS for fishing. With proposed regulatory limits, promotion of careful use of weighted marker buoys, and the relatively small number of fishermen expected to use weighted marker buoys in the sanctuary, the potential effects on GRNMS habitat are expected to be less than significantly adverse.

Socioeconomic Resources

As noted in the no-action alternative (Alternative 1) above, public comment and sanctuary advisory council discussion during scoping for the management plan review indicated strong support for an exemption in the current regulations to allow the use of weighted marker buoys. The proposed exemption to existing regulations allowing the use of weighted marker buoys in the sanctuary for diving safety and fishing convenience is expected to result in less than significant beneficial effects for recreational divers and fishermen.

Anchoring in GRNMS is currently prohibited so recreational diving must be conducted by "live-boat" and recreational fishing by trolling or drifting with a vessel. GRNMS regulations also prohibit the "placement" of any material on the bottom, which prevents the use of weighted marker buoys that sit on the bottom with a float on the surface to mark recreational divers or recreational fishing locations. The proposal to allow weighted marker buoys is primarily for the purpose of enhancing recreational diving

safety. Markers provide a stationary point for divers to more accurately locate a dive site and for boat operators to find divers on their ascent. As noted above in Biological and Physical Resources, GRNMS does not attract many divers. Those who would dive in GRNMS with an allowed marker buoy would benefit.

Recreational anglers would be expected to realize less than significant beneficial effects if weighted marker buoys are allowed to mark a fishing location in the sanctuary. The use of marker buoys, however, is more of a convenience than a necessity for fishing in GRNMS. Recreational bottom anglers sometimes prefer the use of weighted marker buoys to mark and relocate a fishing spot as their boat drifts.

As noted above, GRNMS would require that weighted marker buoys be continuously tended and used during otherwise lawful fishing or diving activities. Weighted marker buoys would not be attached to a vessel and would not be capable of holding a boat at anchor. Weights used with a marker buoy would not have a combined weight of more than ten (10) pounds and would be attached with line that is no greater than one-fourth inch (1/4"). Weighted marker buoy would need to be removed from the sanctuary within twelve (12) hours of deployment. Any weighted marker buoy that is not continuously tended could be removed by authorized personnel without notice.

GRNMS Infrastructure

Proposing an exemption for weighted marker buoys to be used by recreational users of GRNMS is expected to require some additional staff effort to conduct outreach on the proper equipment and careful use to prevent effects on the sensitive live-bottom habitat. The overall effect on GRNMS management capabilities is expected to be negligible.

Cumulative Effects of the Proposed Action

This section discusses and analyzes the cumulative impacts (effects) of the proposed action when viewed in the context of other past, present, and reasonably foreseeable influences and impacts.

Other activities occurring in the affected environment that could have direct or indirect impacts on the environment include:

- Oil, gas and renewable energy exploration (e.g., seismic surveys)
- Military activities (e.g., active sonar and training and testing exercises)
- GRNMS research area designation
- SAFMC actions addressing declines in reef fish species
- Climate change
- Invasive species

Activities to manage the sanctuary proposed in the revised management plan generally result in beneficial effects to the biological and physical resources of the affected environment. Only very slight adverse effects from adopting the revised management plan and proposing the clarification to the anchoring prohibition and an exemption to existing regulations have been identified. However, the positive impacts do not meet the NEPA threshold for significance because the activities would primarily provide incremental additional resource protection for sanctuary resources.

Oil, Gas and Renewable Energy Exploration (e.g., seismic surveys)

Biological, Physical, Socioeconomic and Infrastructure Resources

Offshore exploration for oil, gas and renewable energy sources has the potential to adversely impact the affected environment. Seismic surveys may affect living marine resources in the region, as well as in GRNMS. Activities to manage the sanctuary proposed in the revised management plan generally result in beneficial effects overall. Combined with the stressors of energy exploration, however, the overall effects of the proposed action cannot be calculated due to the large portion of the U.S. Exclusive Economic Zone that is being proposed for energy exploration in comparison with the small (22 square mile) area of GRNMS. Therefore, the proposed action is not expected to reach any determined level of significance.

Military Activities

Biological, Physical, Socioeconomic and Infrastructure Resources

Ongoing and proposed military activities, primarily U.S. Navy Atlantic Fleet Training and Testing operations, have the potential to adversely impact the affected environment. Active sonar and other training-related activities may affect habitat and living marine resources in the region, as well as in GRNMS. Activities to manage the sanctuary proposed in the revised management plan generally result in beneficial effects overall. Combined with the stressors of military activities, however, the overall effects of the proposed action cannot be calculated due to the expansion portion of the Atlantic Ocean of the eastern United States that is being proposed for Navy activities in comparison with the small (22 square mile) area of GRNMS. Therefore, the proposed action is not expected to reach any determined level of significance.

GRNMS Research Area Designation

Biological, Physical, Socioeconomic and Infrastructure Resources

The GRNMS research area became effective in December 2011. The purpose of the research area is to provide a control area within the sanctuary that permits scientists to study a natural near-shore marine community and help determine the effects of natural and human-induced activities on live-bottom habitat resources. The research area, in combination with the proposed revised management plan and regulatory changes, is expected to result in beneficial effects to the affected environment. In terms of socioeconomic resources, however, the research area was determined to have no impact although a small number of users were expected to be displaced (ONMS 2011). The proposed exemption in this action to allow the use of weighted marker buoys would provide a small beneficial effect for users of the affected environment (outside of the research area). Overall, the proposed action is not expected to reach a level of significance.

SAFMC Actions Addressing Declines in Reef Fish Species

Biological, Physical, Socioeconomic and Infrastructure Resources

On a regional basis, the SAFMC is implementing and considering actions to address the overfished and/or overfishing status of several reef fish species. Certain time-limited prohibitions and spatial closures are being implemented or proposed by SAFMC. The specific cumulative effects of the proposed action in combination with SAFMC actions are unfeasible to calculate due to the large portion of the U.S. Exclusive Economic Zone under the jurisdiction of the SAFMC compared to the small area (22 square miles) of GRNMS. Therefore, the proposed action is not expected to reach any determined level of significance.

Climate Change

Biological, Physical, Socioeconomic and Infrastructure Resources

Climate change, including ocean acidification, is projected to profoundly affect coastal and marine ecosystems on a global scale, and GRNMS is expected to manifest the consequences as well. Other human-induced disturbances, such as loss of habitat, also influence coastal and marine systems, often reducing the ability of systems to adapt. Specific and reliable forecasts for the marine environment are, however, still not possible and the effects may also vary greatly by region. Therefore, it is difficult to assess the potential effects of climate change over the next few decades on GRNMS. Overall, climate change is expected to add to the cumulative adverse impacts of both natural and human-caused stressors on resources of the affected environment. The specific cumulative effects of the proposed action cannot be calculated due to the large portion of the globe that is affected by climate change in comparison with the small (22 square mile) area of GRNMS. Therefore, the proposed action is not expected to reach any determined level of significance.

Invasive Species

Biological, Physical, Socioeconomic and Infrastructure Resources

In GRNMS, the invasive and venomous Indo-Pacific lionfish has been documented, along with the titan acorn barnacle, green mussel, and orange cup coral (ONMS 2012). Of these invasive species, the lionfish has the greatest known potential to alter the biological and physical resources of GRNMS because lionfish are prolific spawners and voracious predators. As with climate change, invasive species are expected to add to the cumulative adverse impacts of both natural and human-caused stressors on all resources of the affected environment. The proposed action, however, may provide critical information, including more intense monitoring of invasive species, to inform management responses to invasive species impacts. Thus, the proposed action to adopt a new management plan of activities and regulatory changes may somewhat offset the cumulative adverse impacts of invasive species by continuing and enhancing monitoring and study activities on invasive species effects. Cumulatively, however, the overwhelming issue of invasive lionfish in the Atlantic and Caribbean seas combined with the proposed action is not expected to reach a level of significant effects.

Conclusion

The preferred alternative to adopt the proposed, revised GRNMS management plan along with new vision and mission statements, revised goals, objectives and activities considered together with other natural and human-induced effects to sanctuary resources, generally result in a cumulative beneficial impact to these resources. There are some expected negative effects related to infrastructure burdens, but they are minor compared to the overall benefits to the biological and physical resources of GRNMS. Overall, however, no impacts meet the NEPA threshold for significance.

Appendices

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Personal Communications

Hyland, J., NOAA NCCOS, Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC.

McFall, G.B., NOAA Gray's Reef National Marine Sanctuary, Office of National Marine Sanctuaries, Savannah, GA.

Additional Website Resources

Gray's Reef National Marine Sanctuary Web Site: http://graysreef.noaa.gov/

Office of National Marine Sanctuaries Web Site: http://sanctuaries.noaa.gov/

APPENDIX B: Purposes and Policies of the NMSA as Amended (16 USC §1431 *et seq*.)

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;

(2) to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;

(3) to maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes;

(4) to enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;

(5) to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;

(6) 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;

(7) to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;

(8) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques; and

(9) to cooperate with global programs encouraging conservation of marine resources.

Appendix C: GRNMS Condition Report Addendum Summary Table

The following table summarizes the "State of Sanctuary Resources" section of this report. 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. 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 that have new information to report since the 2008 Gray's Reef National Marine Sanctuary Condition Report (ONMS 2008) are those with red numbers (questions 1, 5, 6, 8, 9, 10, 12 and 14).

#	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?	–	Limited data since 2000 suggest comparatively unaltered oxygen, temperature, and salinity, and some contaminants, but below EPA guidelines.	Conditions do not appear to have the potential to negatively affect living resources or habitat quality.	Recognized challenges due to coastal and inland development, population increases and climate change. Continue monitoring for nutrient levels, contaminants and indicators of climate change.
2	What is the eutrophic condition of sanctuary waters and how is it changing?	?	Comparatively unaltered levels of nutrients and chlorophyll, and lack of harmful algal blooms.	Conditions do not appear to have the potential to negatively affect living resources or habitat quality.	
3	Do sanctuary waters pose risks to human health and how are they changing?	–	2000 baseline, 2005 indicators below FDA Levels of Concern.	Selected conditions that have the potential to affect human health may exist, but human impacts have not been reported.	
4	What are the levels of human activities that may influence water quality and how are they changing?	–	Increasing human activities, but little evidence of negative effects.	Few or no activities occur that are likely to negatively affect water quality.	

Table continued on following page.

HABITAT					
5	What are the abundance and distribution of major habitat types and how are they changing?	?	New map data recently collected; assessment of trends awaits comparison to earlier data.	Habitats are in pristine or near-pristine condition and are unlikely to preclude full community development.	Final management plan contains anchoring prohibition and outreach plans, and marine debris outreach, education and monitoring programs. Sanctuary will enhance ongoing science to better understand biologically-structured habitat, continue monitoring benthic fauna and sediment quality, and conduct studies in research area to discern between human-induced and natural changes.
6	What is the condition of biologically structured habitats and how is it changing?	?	Recent data on biological assemblages suggest ephemeral nature of predominant human impacts (anchoring, fishing).	Habitats are in pristine or near-pristine condition and are unlikely to preclude full community development.	
7	What are the contaminant concentrations in sanctuary habitats and how are they changing?	—	Low contaminant levels in 2000 and 2005.	Contaminants do not appear to have the potential to negatively affect living resources or water quality.	
8	What are the levels of human activities that may influence habitat quality and how are they changing?	▲	Human impacts localized within areas of heavy use.	Selected activities have resulted in measurable habitat impacts, but evidence suggests effects are localized, not widespread.	

TABLE CONTINUED ON FOLLOWING PAGE.

GRAY'S REEF NATIONAL MARINE SANCTUARY CONDITION SUMMARY TABLE (CONTINUED)

#	Questions/Resources	Rating	Basis for Judgment	Description of Findings	Sanctuary Response
LIVING RESOURCES					
9	What is the status of biodiversity and how is it changing?	—	High diversity of sessile invertebrates, benthic infaunal invertebrate density and abundance, and algal abundance and diversity.	Biodiversity appears to reflect pristine or near-pristine conditions and promotes ecosystem integrity (full community development and function).	Fishing is limited to rod and reel, handline, and spearfishing without powerheads. Spearfishing is under review. Regulations prohibit divers from taking marine organisms. A research area has been proposed to evaluate impacts of bottom fishing. Education and outreach programs are in place that promote good diving techniques. Monitoring will continue for invasive species. Sanctuary will confirm and characterize key species, conduct analysis of sponge mortality samples and monitor key species.
10	What is the status of environmentally sustainable fishing and how is it changing?	▲	Recent data showing improvements in black sea bass and red snapper; need more data on non-targeted species to assess ecosystem impacts.	Extraction may inhibit full community development and function, and may cause measurable but not severe degradation of ecosystem integrity.	
11	What is the status of non-indigenous species and how is it changing?	▼	Occasional lionfish sightings in sanctuary since 2007; titan acorn barnacle, Asian green mussel and orange cup coral currently only found on manmade structures.	Non-indigenous species exist, precluding full community development and function, but are unlikely to cause substantial or persistent degradation of ecosystem integrity.	
12	What is the status of key species and how is it changing?	▲	Recent improvements in black sea bass and red snapper populations.	Selected key or keystone species are at reduced levels, perhaps precluding full community development and function, but substantial or persistent declines are not expected.	
13	What is the condition or health of key species and how is it changing?	?	Key species tentatively identified but condition and health undetermined; some contaminants detected in sponges, black seabass and arc shells.	N/A	
14	What are the levels of human activities that may influence living resource quality and how are they changing?	▲	Localized within areas of heavy use, with reduced pressure in certain areas due to management actions and the status of the economy, but trend data limited, suggesting a significant monitoring gap.	Selected activities have resulted in measurable living resource impacts, but evidence suggests effects are localized, not widespread.	

TABLE CONTINUED ON FOLLOWING PAGE.

GRAY'S REEF NATIONAL MARINE SANCTUARY CONDITION SUMMARY TABLE (CONTINUED)

#	Questions/Resources	Rating	Basis for Judgment	Description of Findings	Sanctuary Response
MARITIME ARCHAEOLOGICAL RESOURCES					
15	What is the integrity of known maritime archaeological resources and how is it changing?	N/A	No archaeological evidence, though former human occupation remains a possibility based on paleontological data.	N/A	Anchoring has been banned, in part to reduce threat to archaeological resources.
16	Do known maritime archaeological resources pose an environmental hazard and is this threat changing?	N/A	No archaeological evidence, though former human occupation remains a possibility based on paleontological data.	N/A	
17	What are the levels of human activities that may influence maritime archaeological resource quality and how are they changing?	–	Potential for diving and fishing to damage sites.	Some potentially relevant activities exist, but they do not appear to have had a negative effect on maritime archaeological resource integrity.	

Appendix D: Agencies and Persons Consulted / Distribution List

In addition to the preparers listed on page 2, the following agencies and persons were consulted in preparation of this document. In addition to the general public, these same individuals, agencies and organizations also received a copy of the document:

Persons - Gray's Reef National Marine Sanctuary Advisory Council

Dr. Daniel Gleason – living resources research representative
Dr. Clark Alexander – former non-living resources research representative
Dr. Scott Noakes – non-living resources research representative
Ms. Venetia Butler – former K-12 education representative
Ms. Emily Kroutil – K-12 education representative
Capt. Warren Hupman – charter/commercial fishing representative
Ms. Kellie Parr – former sport diving representative
Mr. Randy Rudd – sport diving representative
Ms. Mary Conley – conservation representative
Dr. Anna George – conservation representative
Dr. Scott Harris – former university education representative
Dr. Timothy Goodale – university education representative
Mr. Tim Tarver – former sport fishing representative
Mr. Michael Denmark – sport fishing representative
Mr. William Cliett – citizen-at-large representative
Ms. Christine Laporte – citizen-at-large representative

Agencies - Gray's Reef National Marine Sanctuary Advisory Council

Mr. Rick DeVictor – National Marine Fisheries Service – SERO representative
Dr. Jack McGovern – alternate National Marine Fisheries Service – SERO representative
Mr. Pat Geer – GADNR Coastal Resources Division representative
Ms. January Murray – alternate GADNR Coastal Resources representative
Capt. Doug Lewis – GADNR law enforcement representative
LT Brandon Fisher – former U.S. Coast Guard representative
LT Mike Mastrianni – U.S. Coast Guard representative
LTJG Jason Holstead – alternate U.S. Coast Guard representative
Mr. Dorset Hurley – former Sapelo Island NERR representative
Ms. Suzanne VanParreren – Sapelo Island NERR representative
SA Al Samuels - NOAA Office of Law Enforcement representative
Mr. Jene Nissen – U.S. Navy representative
Dr. Charles Hopkinson – NOAA Sea Grant representative

Persons/Agencies – Gray's Reef National Marine Sanctuary Advisory Council's Science Advisory Group

Jeff Hyland
NOAA Center for Coastal Environmental Health & Biomolecular Research

Marcel Reichert
SC Department of Natural Resources
Marine Resources Research Institute

Offshore Finfish Section
Charleston, SC

Scott Noakes
University of Georgia
Center for Applied Isotope Studies

Rick DeVictor
NOAA Fisheries Service
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Roldan Munoz
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South Atlantic Fishery Management Council

Marc Frischer
Skidaway Institute of Oceanography

Laura Kracker
NOAA Center for Coastal Environmental Health & Biomolecular Research

Andy David
NOAA Fisheries Service
Southeast Fisheries Science Center

Danny Gleason
Department of Biology
Georgia Southern University

Pat Geer
Georgia Department of Natural Resources
Coastal Resources Division

Paul Gayes
Coastal Carolina University
Center for Marine and Wetlands Studies

Peter Auster
NURTEC
University of Connecticut

Nisse Goldberg
Jacksonville University

John Heine
California COFI

Appendix E: DEA Distribution List

The GRNMS draft management plan/draft environmental assessment was distributed to the following in addition to the individuals and agencies consulted (Appendix D):

Congressional/Senate

The Honorable Saxby Chambliss
U.S. Senate

The Honorable Johnny Isakson
U.S. Senate

The Honorable Jack Kingston
U.S. House of Representatives

The Honorable John Barrow
U.S. House of Representatives

Federal Committees

The Honorable Jay Rockefeller
Chair, Committee on Commerce, Science, and Transportation
U.S. Senate

The Honorable Doc Hastings
Chair, Resources Committee
U.S. House of Representatives

Fishery Management Council

Mr. Robert Mahood
Executive Director
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
North Charleston, SC 29405

Federal Agencies

U.S. Department of State
Bureau of Oceans and International Environmental and Scientific Affairs

U.S Department of Defense
Installations & Environment

Navy Region Southeast
U.S. Fleet Forces Command

Naval Submarine Base Kings Bay

U.S. Army Corps of Engineers
Savannah District

U.S. Department of Transportation
Maritime Administration (MARAD)

U.S. Department of the Interior
Office of Environmental Policy and Compliance

Bureau of Oceans and Energy Management

Fish and Wildlife Service
Southeast Region

U.S. Environmental Protection Agency
Office of Ocean, Wetlands, and Watersheds

Region IV NEPA Coordinator

U.S. Coast Guard
Vice Commandant

Atlantic States Marine Fisheries Commission

U.S. Department of Commerce
NOAA Fisheries Service
Office of Protected Resources

Southeast Regional Office

Sustainable Fisheries Division

NEPA Coordinator

NOAA Office of General Counsel
Ocean Service
Enforcement and Litigation
Southeast Regional Counsel

State Agencies

GA Department of Natural Resources

Coastal Resources Division

Wildlife Resources Division

AMERICA'S UNDERWATER TREASURES